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The Oil Man's Calendar

JUNE 1-3	American Petroleum Institute, Mid-Year Meeting, Colorado Springs, Colorado.
5	San Joaquin Oil Men's Barbecue for California Oil Men, Bakersfield.
10-12	Pennsylvania Grade Crude Oil Association, Sailing from Buffalo, New York.
11	Interstate Oil Compact Commission, Santa Fe, New Mexico.
14-19	Second World Congress of Petroleum Paris, France.
17	National Stripper Well Association, Tulsa, Oklahoma.
20-26	Golden Celebration of Oil and Gas, Findlay, Ohio.
25-27	National Oil Scouts Association, Dallas, Texas.
JULY	Seventeenth International Geological Congress, Moscow, U.S.S.R.
12-13	Interstate Oil Compact Commission, Santa Fe, New Mexico.
AUG. 10-15	Third Michigan Oil & Gas Assn., Mt. Pleasant.
SEPT. 15-17	National Petroleum Association, Hotel Traymore, Atlantic City, New Jersey.
SEPT. 27 OCT. 1	American Gas Association, Cleveland, Ohio.
OCT. 11-16	Oil-World Exposition, Houston, Texas.
14-16	Independent Petroleum Association of America, Houston, Texas.
29-30	Mid-Continent Oil and Gas Association, Texas Division, Dallas, Texas.
NOV. 9-12	American Petroleum Institute, (Annual), Chicago, Illinois.

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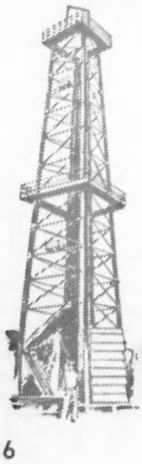

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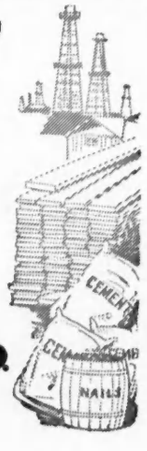

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LOOKING AHEAD

WITH THE EDITOR

A. P. I. Mid-Year Meeting This Week . . .

A. P. I. Production Papers to Be Published . . .

OFF TO Colorado Springs—and the Mid-Year Meeting of the American Petroleum Institute. However, all our time there cannot be spent in attending the many interesting sessions, or in exploring Pikes Peak—for this important meeting must be covered thoroughly for the many thousands who were unable to attend personally. The June 7 issue of THE OIL WEEKLY will carry some of the many valuable papers that will be presented at the Division of Production meetings, and will also publish the first complete news of the convention. As near as is possible, our next issue will bring this important technical meeting to your door.

DUE TO the American Petroleum Institute meeting, and the fact we believe many of our readers will want as complete coverage of it as possible to give, and as quickly as possible, next week we will forego the pleasure of publishing the next installment in our "Equipment Care Series." This space will be devoted to API papers.

We make this statement because of the interest that has been aroused by publication of the first two articles of the "Equipment Care Series." We have received a number of congratulatory letters, and, already, orders for reprints are near the 8000 mark, and still coming in. It is not too late to take advantage of our offer of reprints of the first two articles at a nominal cost, but do not delay too long. The first article on care of oil equipment was devoted to wire lines, and appeared May 17. The second dealt with sucker rods, and was published May 24.

THIS WEEK

» THE BROADMOOR HOTEL, where those attending the Mid-Year meeting of the American Petroleum Institute will gather this week, is in the center of 3000 acres of grounds right at the foot of two famous mountains—Pike's Peak and Cheyenne Mountain. The Rocky Mountains tower above the hotel, which also has a remarkable view of the prairies that roll in from Oklahoma and Kansas.

THE moderate increase in the price of crude oil in the East Texas field a week ago might have been a general one if production had been held to consumer demand during the past several months. But the addition of 20 million barrels in 16 weeks ruined the chances of this occurring. However, hope remains that a general crude price raise may occur. This hope is based on the prospects that the nation's production may come closer to consumer demand during June. **Page 13.**

A MOTION in which the return of documents taken from major oil companies in the "conspiracy case" was sought, has been rejected. This action was sought on the ground that the grand jury, which indicted 26 companies and 71 executives, was illegally drawn. While admitting the jury was irregularly selected, the judge held the irregularities were minor and inconsequental. **Page 10.**

THE Connally hot oil bill, which had been given preference and was expected to be introduced in the House of Representatives on May 25, was delayed because of the necessity of taking care of relief measures. This, coupled with the Memorial Day holiday, means it cannot come up before June 1 or 2 now, which is but two weeks before the present act expires. **Page 11.**

LOUISIANA'S allowable for June has been set at 254,650 barrels, the highest level in history. This figure compares with a state allocation of 240,900 barrels in May, and with a June recommendation of 252,000 barrels from the Bureau of Mines. The largest increase went to Iberia Parish in Southern Louisiana. **Page 10.**

CURRENT SITUATION

(Latest Available Weekly Data)

Outlook.—Favorable, due to prospects of better crude control in June.

Crude Market.—Firm. Price increase limited to East Texas.

Refined Oil Markets.—Some gains in prices believed likely.

Crude Production. — Up 20,675 barrels to another new peak.

Crude Runs to Stills.— Up 155,000 barrels daily to new all-time peak.

Crude Stocks.—Up 1,127,000 barrels in week ended May 15; gain of 20,154,000 in 16 weeks.

Gasoline Stocks.— Down 551,000 barrels.

Gas and Fuel Oil Stocks.—Down 205,000 barrels.

Drilling.— Completions last week up 27; total wells, 576.

See* MARKET SECTION *for Details

IF LONG, satisfactory performance is to be procured from electric motors it is necessary to take only a limited number of simple precautions to avoid subjecting them to injurious treatment. However, it is highly important that these be followed regularly. In general, it may be said that all parts of an electric motor should be handled with care. **Page 15.**

THE East Texas field occupies a unique position in the industry. It is the largest field in the world, from the standpoint of number of acres, number of wells, amount of potential, estimated future recovery and production recovered. Because of its great economic importance, it is well to closely study the general conditions prevailing in East Texas at periodic dates. This is done in this issue by W. S. Morris. **Page 35.**

THE great East Texas field presents one of the most interesting gas-lift prospects ever known. With the vast amount of fundamental information regarding every phase of well conditions that have been gathered in the field, it is possible to give gas-lift a true opporunity. The practices being used in the field are therefore of interest. **Page 44.**

TWENTY-SEVEN percent of the wells in the East Texas field have been equipped with pumping equipment, leaving 73 percent to be equipped in the future. Physical characteristics of the field divided into three natural parts, each of which demands separate consideration in selecting equipment. Therefore, practically all types will be used in the field. **Page 24.**

Reject Motion

RULE AGAINST RETURN OF ANTI-TRUST CASE DOCUMENTS

Madison, Wis.—Federal Judge Patrick T. Stone late Thursday rejected a motion in the government "oil conspiracy" case by which defense attorneys sought return of several tons of impounded documents subpoena from major oil companies for examination by a federal grand jury, and which government attorneys plan to use in trial scheduled for September 27, here.

Return of the documents was sought on the ground that the grand jury for which they were obtained, and which subsequently indicted 26 major oil companies, 71 of their officers and three trade journals, was illegally drawn. When defense attorneys raised this issue last December government attorneys immediately impaneled a new grand jury, which issued similar indictments based on the evidence presented to the first investigating body.

Pleas of innocence to the charges, which allege conspiracy to artificially raise gasoline prices and to "squeeze out" independent jobbers, have been entered in behalf of the corporate defendants and almost all the individual defendants. Several individual defendants await arraignment here, and removal hearings are being held for four who refused to waive removal to Madison.

In a formal order Thursday Judge Stone conceded that there were irregularities in the selection of the grand jury, but declared that the clerk and jury commissioner had acted "impartially, honestly and in good faith" and that the irregularities were "inconsequential, technical and unimportant," and did not result in prejudice, harm or inconvenience to the defendants. The procedure "was in substantial compliance with the law."

While some of the documents have since been unconditionally returned to the defendants. Others were released to aid defense attorneys in preparing for trial only on their promise that they would be returned 30 days before trial.

NATIONAL SCOUTS

Expect record number at Dallas gathering

Dallas, Texas.—Annual convention of the National Oil Scouts Association of America to be held here June 25-26 is due to set an attendance record, based upon preliminary hotel reservations. The program committee, headed by Howard Boyd, chief scout for Magnolia Petroleum Company, has arranged for the delivery of a group of technical papers by qualified engineers on subjects of direct interest to scouts, and an address will be given by William R. Boyd, Jr., executive vice president of the American Petroleum Institute.

Varied program of entertainment to follow the business sessions will include a stag smoker on the opening day; group tour of the Pan-American Exposition; and a dinner-dance. Bridge luncheon, theater party and style show will feature the entertainment in store for the wives of the scouts. Convention headquarters will be in the Baker Hotel.

Other members of the program committee include: John H. Langston, Sun Oil Company; Ed. Harmon, Seaboard Oil Corporation; E. L. Wilson, Maracaibo Oil Exploration Corporation; Ben Jones, Republic Production Company; and Chas. H. Linehan, Standard Oil Company of Texas.

LANGFORD APPOINTED

Texas commission names him new chief engineer

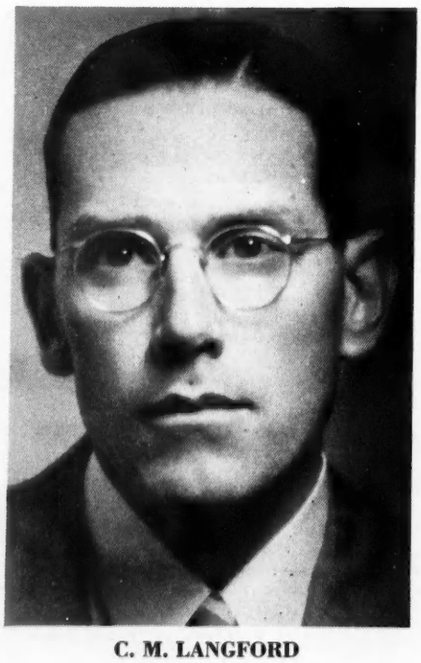
Austin.—C. M. (Charley) Langford has been named chief petroleum engineer for the Texas Railroad Commission effective June 1. Langford will succeed J. E. Bailey, who resigned to join the staff of the Tide Water Associated Oil Company (see page 60).

Langford comes to the Austin office of the Railroad Commission from the Kilgore office, where he has served as chief engineer since March of last year.

The new chief was graduated from the University of Texas in 1926, and subsequently did research work for Crane Packing Company in the Big Lake, Borger, and Seminole fields. He studied problems relating to drilling equipment and compressors, as well as maintenance and installation. In 1930 he joined the research staff of Whealton and Townsend, where he specialized in engineering problems relating to air-gas lift.

He returned to Crane Packing Company at the end of a year and continued his work there.

Langford joined the Railroad Commission staff in the East Texas field in September, 1934, and remained there until named to the Austin post.



C. M. LANGFORD

ALLOWABLES RAISED

Louisiana June quota set at its highest level

Shreveport. — Louisiana's allowable for June will be largest since proration was adopted in the state. Dr. J. A. Shaw, director of the minerals division, has announced the state's allowable for the month will be 254,650 barrels, as compared with 240,900 barrels. However, the figure is not very far in excess of Bureau of Mines recommendations, which were for 252,000 barrels per day.

Fields in Southern Louisiana were given a combined allowable of 175,850 barrels, an increase of 8450 barrels over May. North Louisiana's allowable will be 78,800 barrels, a hike of 5300 barrels over May.

The largest increased allowable for the month was given Iberia Parish, which was boosted 9500 barrels to 15,000 barrels daily. Lisbon field, North Louisiana, was boosted 5300 barrels to 6300 barrels. The Caillou Island field, South Louisiana, was increased 500 barrels to 18,000 barrels, and the Evangeline field received a similar increase.

Although the Rodessa field (Louisiana side only) will have a daily allowable of 50,000 barrels, the same as during May, the June augmented daily allowable was placed at 66,000 barrels, equally allotted to acreage and bottom-hole pressure. The area allotted to oil wells is 6,907.2 acres, with the acreage factor of one acre equally 4.7776 barrels.

Bottom-hole pressures taken from the contour map of the Louisiana Conservation Commission as of May 1, 1937, show a total pressure of 507,504 pounds on the Louisiana side. In calculating the bottom-hole pressure allowable, one pound is equal to 0.0650 barrels. Of the 374 wells on the Louisiana side, individual allowables were given 284 wells. The per well allowable for June runs from six barrels daily to 335 barrels.

The June daily allowable of the Lisbon field, Claiborne and Lincoln Parishes, was set at 6300 barrels. The minerals division of the Louisiana Conservation Commission has just completed its first check of the bottom-hole pressures of the field. Of the field allowable, 4725 barrels was allocated to acreage and 1575 barrels on bottom-hole pressure. The area allotted to oil wells was 398.7 acres, the acreage factor being that one acre equal 11.851 barrels. Total bottom-hole pressure was given as 37,674 pounds, one pound equaling .04181 barrels.

Delay Hot Oil Bill

HOUSE CANNOT CONSIDER IT NOW BEFORE JUNE 1 OR 2

Washington, D. C.—Difficulties encountered in passing the 1½ billion dollar relief bill, and the desire of members to vacation over the Memorial Day holiday, thwarted plans of House leaders to bring up the Connally-Dies bill, extending the operation of the Connally contraband oil act, last week.

Originally planned to be taken up on May 25, failure to dispose of the relief legislation made it necessary to postpone consideration of the oil measure until May 28, when it was again suspended, probably not to be reached until June 1 or 2.

While supporters of the legislation remain confident that they will secure the approval of the House, representatives of independent marketers have flooded members with protests against the continuance of the hot oil act as an aid to monopoly by the integrated companies.

As a result, it is anticipated that a fight will be made on the bill by members from the Eastern consuming states, but administration leaders assert they have a sufficient number of votes lined up to assure passage.

With but two weeks remaining before the expiration of the Connally act, the extension bill will be rushed to conference immediately after it is passed by the House. Members of the Senate are said to be agreeable to the House proposal to limit the life of the act to a specific term, although they are represented as desiring that the period be made four years instead of the two, which the House will approve. However, it is not anticipated that any great difficulty will be encountered by the conferees in agreeing to the two year limitation.

OKLAHOMA QUOTA

June allowable set at Bureau recommendation

Oklahoma City.—After listening to charges of waste in the Moore pool and pleas for higher well output for the Hunton lime wells at Fitts, the Oklahoma Corporation Commission May 26, fixed the allowable for the state at 625,300 barrels daily. This corresponds with the recommendation of the United States Bureau of Mines and compared with 622,700 barrels daily for May.

In writing the order the commission urged its field force to enforce regulations in order to bring output within the recommended figure. Actual output in recent weeks has been around 650,000 barrels daily. The daily output for April was 663,895 barrels daily.

The plea for higher allowable for Hunton lime wells at Fitts was made by representatives of E. H. Moore, Inc. on the basis that restriction on these wells is greater than for any other Class C pool in the state. George M. Vandiver, engineer for E. H. Moore, Inc., testified that Hunton lime wells at Fitts could produce four percent of potentials without waste. Present potential of these wells is 754,263 barrels daily, which holds per well output to around 95 barrels daily in order to keep within the 24,000 barrels allowed from the formation. By June 1 he said there would be 267 Hunton lime wells

[*Continued on page 73*]

LABOR SITUATION

Unions continue drive but get small results

Houston.—Labor-employer relations in the oil industry have continued generally peaceful.

While the national labor unions have been pushing their campaigns for membership from the ranks of oil company workers, they have met with some additional aloofness on the part of those employes.

Featuring the drives for membership lately has been the campaign of John L. Lewis's Committee for Industrial Organization in the oil fields of Southern California, where union organizers have concentrated intensive efforts.

In the "Standard Oil" group, the unions continue to be given very little encouragement. Office employes of the Stanolind Pipe Line Company at Tulsa have organized an independent association to replace the former company sponsored employes' organization, declining to tie in with any national labor union. This action was similar to that taken previously by employes of Humble Oil & Refining Company and Standard Oil Company of Louisiana at Texas and Louisiana refineries.

At the Atlantic seaboard refineries of Standard Oil Company of New Jersey, employes are planning to form an independent association to handle the problems arising between employer and employes. The company has plants at Elizabeth, Bayway, Linden Bayonne, and Jersey City, and employes in all those areas will vote on the type of organization they will set up. Meanwhile, the C.I.O. has opened a campaign in the attempt to become the bargaining agency for the Standard of New Jersey workers.

STRIKE IS CALLED

Mexico's shortage of fuel and gas already acute

Threats of labor leaders in Mexico were carried out at midnight May 27 when oil company workers called a general strike, virtually paralyzing the oil industry there, with the exception of the government's integrated oil company, according to a telegram received from Mexico City. Reason for the strike was failure of the companies and labor unions to agree on a blanket labor contract by May 27.

Additional information received May 28 indicates the fuel and gasoline shortage in Mexico is already acute.

Press dispatches from Mexico City declared 17 companies and 18,000 workers are involved.

Workers want a 40-hour week and a raise in pay to a minimum of six pesos per day. They now have a 44-hour week and a minimum wage of 4.3 pesos per day.

The strike will cost the government from $55,000 to $80,000 per day in lost revenue.

A. P. I. Meeting

ADVANCE OPENING DATE FOR MID-YEAR SESSION

Colorado Springs.—The opening date of the seventh mid-year meeting of the American Petroleum Institute to be held in the Broadmoor Hotel at Colorado Springs, Colorado, has been advanced to May 31 to provide sufficient time for holding additional committee meetings. The group sessions of divisions and departments will be held on June 2 and 3, as originally scheduled, but committee meetings will begin Monday, May 31, instead of Tuesday, June 1, as originally planned.

The preliminary program for the meeting has been completed with the announcement of the schedule of group sessions to be held by the Division of Production, and the tentative approval by the division's program committee of technical papers to be presented. The production division program follows:

Wednesday, June 2, 9:30 a.m., ball room. Group session on allocation and production problems, with J. T. Hayward, Barnsdall Oil Co., Tulsa, Okla., presiding.

"Application of Phase Equilibrium Data to the Estimation of Oil and Gas Reserves." (Institute Research Project No. 37) by B. H. Sage and W. N. Lacey, of California Institute of Technology, Pasadena, Calif.; "Proration of Allowable Oil Production," by L. L. Foley, consulting petroleum engineer,

THEY SPEAK AT MIDYEAR MEETING OF API DIVISION OF PRODUCTION

J. T. HAYWARD

Tulsa, Okla.; and "A Witness' Duties and Rights," by W. M. Fleetwood, Jr., Barnsdall Oil Company, Tulsa, Okla.

2:00 p.m., ball room. Group session on drilling practice, with C. E. Reistle, Jr., Humble Oil & Refining Company, Houston, Texas, presiding.

"Cause and Cure of Frozen Drill Pipe and Casing," J. T. Hayward, "Standard Practices for Field Testing of Drilling Fluids," by C. E. Reistle, Jr., G. E. Cannon, and R. C. Buchan, all of Humble Oil & Refining Company, Houston, Texas; and "Pressure Maintenance and Unitization; South Burbank Pool," by I. S. Salnikov, of The Carter Oil Company, Fairfax, Okla., and M. L. Haider, of The Carter Oil Company, Tulsa.

Thursday, June 3, 9:30 a.m., ball room. Group session on oil country tubular goods, with C. W. Froome, Union Oil Company of California, Santa Fe Springs, Calif., presiding.

"The Measurement of Pipe Threads," by B. B. Wescott, Gulf Research and Development Company, Pittsburgh, Pa., "Progress Report on Special Tests on Thread Elements," by C. W. Froome (recounting preliminary findings from a series of special tests on samples of casing being conducted in Pittsburgh, Pa., to determine the limits, or tolerances, on the various thread elements assuring tight and serviceable joints, as witnessed by the Institute's Engineering Sub-Committee on Tubular Goods); and "Abuse in Handling Tubular Goods," by L. R. Smith, Tide Water Associated Oil Company, Los Angeles, Calif.

Thursday afternoon Sessions

2:00 p.m., ball room. Group session on production practice, with W. E. Gilbert, Shell Oil Company, Los Angeles, presiding.

"Plunger Travel of Oil Well Pumps," by Robert W. Rieniets, Sargent Engineering Corporation, Huntington Park, Calif.; "Vibration Problems in Oil Wells," by J. C. Slonneger, The Continental Supply Company, Dallas, Texas; and "Pumping Slant Holes at Huntington Beach, California," by Donald K. Weaver, Wilshire Oil Company, Inc., Norwalk, Calif.

The Division of Production Central Committee on Drilling and Production Practice, which sponsors all the production group sessions, will meet at the close of the Thursday afternoon program.

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Hope Still Remains for Higher Prices

Failure of East Texas crude raise to spread throughout United States attributed to excessive production past four months.

Industry is in favorable inventory position, however; and if better control of output is exercised henceforth, a general advance is a distinct possibility.

Recent general developments that cause worry in some industries induce but little anxiety among oil companies.

By L. J. LOGAN
Associate Editor

OF all the sad words of tongue or pen, the saddest currently are on the lips of oil producers: "It might have been."

The moderate increase in the price of crude oil in East Texas a week ago might have been extended generally throughout the United States if production for the past several months had been held down to consumer demand.

Production Above Demand

Soon after the crude raise of late January this year, agitation got under way for a further increase in postings, and the prospects for realization of that objective seemed promising.

But almost simultaneously, the restraints on crude production were loosened, and crude oil began going into storage at the average rate of over a million barrels a week.

In the 16 weeks from January 23 to May 15, the United States stocks of crude oil were increased 20,154,000 barrels; or from 285,211,000 to 305,365,000 barrels.

Effective May 22 there was another crude price raise. But it was a local increase, limited to the East Texas field.

Whereas there had been hope of a general advance around this time, only one district experienced the fulfillment of the hope.

Hope Remains

However, unlike some situations in which the lament is made that, "It might have been," the present situation for the oil industry is nevertheless hopeful.

No great damage has been done yet in expanding crude oil storage, and if crude production henceforth is balanced closely with demand, higher crude prices still may be achieved.

In fact, some improvement in crude control is in prospect effective June 1. On that date, the Texas state allowable is scheduled to be within market demand, as estimated by the Bureau of Mines, whereas Texas for several months has been materially exceeding the federal recommendations.

Similarly, several of the other leading producing states have prescribed or are expected to promulgate allowables closely conforming with the Bureau of Mines suggestions.

Crude Raise May Occur Yet

It is indicated, consequently, that for June, the national crude production will be more nearly in balance with demand than for several months.

Furthermore, in view of the unfavorable results of overproduction of crude during the past four months, it is to be expected that comparatively strict production control will be exercised beyond the end of June.

Consequently, it appears quite possible that a general improvement in crude prices still may occur within the next few months or even within a period of weeks.

Oil Producing Costs Up

One important fact involved in this connection is the circumstance that a further price increase over the moderate one of late January appears justified by the sharp advances of material and labor costs that oil companies have encountered. The 10 percent increase of crude prices of January and the attending slight improvement in refined oil prices hardly compensate for the added costs of materials and the raises in salaries and wages lately put in effect by the oil companies.

Inventory Position Good

From the standpoint of economic justification, similarly, there are several factors in favor of further general raising of crude oil prices. Chief among these is the exceptionally favorable inventory position that the industry occupies, despite the recent temporary overproduction of crude.

Although crude stocks have been increasing for about four months, they nevertheless are today lower than a year ago. As compared with the 305,365,000 barrels of crude oil in storage in the United States May 15, there were on hand at the same time a year ago a total of 315,481,000 barrels.

Furthermore, while the crude stocks today are 10,000,000 barrels

lower than a year ago, the demand for petroleum is higher. In the first three months of 1937, the total demand for United States oils ran 10.4 percent higher than in the similar period of 1936.

Gasoline Stocks Satisfactory

Similarly, the stocks of refined oils are at levels largely justified by present rates of consumption. Gasoline inventories as of May 22 totaled 79,827,000 barrels, according to the American Petroleum Institute. Although that total was 10.1 percent larger than the gasoline stocks on hand one year previously, the increase was justified by the gain that has occurred in gasoline consumption. So far this year, the gasoline demand has been running around 10 percent higher than last year.

Fuel Oil Market Strong

Gas oil and fuel oil stocks are even more conducive to strong markets and favorable prices. These stocks as of May 22 totaled but 95,111,000 barrels, or about 5,000,000 barrels less than one year previously, when the storage aggregated 100,212,000 barrels.

While the fuel oil stocks are smaller than a year ago, the demand this year has been running substantially higher. This situation of smaller supply and greater demand naturally promotes a strong market and favorable prices. This strength already has manifested itself concretely through the recent increases of prices of fuel oil and diesel engine oil on the Pacific Coast.

Increased residential building that is occurring this year is stimulating installations of domestic oil burners, and unprecedented consumption of fuel oils by domestic and industrial users almost certainly will occur next fall and winter. Nevertheless, these burning oils are turned out only incidentally in manufacturing the more important gasoline; and for the months ahead, a comparative scarcity of the fuel oils is in prospect. That which will be available consequently promises to bring favorable prices.

Use of Other Products Up

Some of the other petroleum products also are in substantially greater demand this year than last year. Greater industrial activity has stimulated the requirements for lubricants. Increased construction has resulted in larger demand for asphalt. Road oil also is being used more extensively than last year.

In so far as consumption of petroleum products is concerned, the stage is set for strong markets for some time to come. If production is held within consumer demand, the other primary requisite for the strong markets and favorable prices will be fulfilled.

* * *

Lull Not Likely for Oil

THE oil industry probably has less reason for anxiety than most other important industries over recent economic, legislative, and judicial developments.

While there has been much talk of a possible impending lull in trade, the oil industry is entering what will almost certainly be an unprecedented period of gasoline consumption. The vacation season that lies just ahead undoubtedly will bring the most motoring the country has ever experienced. Automobile registrations at present are the greatest on record. And motorists are in the mood and the circumstances for traveling, according to surveys made by various oil companies, railroads, bus lines, and air transport companies.

The much discussed prospective dullness of business consequently is causing little concern among the oil companies.

Wage Laws Not Feared

Similarly, oil companies appear on the records as paying their workers salaries and wages well above the averages for all industries. And consequently they have but little to fear from the current movement toward forcing employers by law to pay certain minimum wages and to work employes no longer than specified hours.

This movement was greatly encouraged, of course, by the Supreme Court decisions upholding both the unemployment insurance and old age pension phases of the Social Security Act. Following those decisions, efforts were renewed in Congress to carry out further legislation aimed at improving working conditions.

It appears likely that the oil industry would be able to comply with the terms of any legislation enacted even without making any important changes in the present working conditions of the oil company employes.

More Leisure, More Motoring

Furthermore, it appears quite possible that the oil industry would actually benefit directly from the contemplated legislation on wages and hours. This possibility has just been pointed out, in fact, by the head of an imporant oil company, who said the reduced working hours, affording more time for recreation, would lead to increased motoring and larger consumption of gasoline.

Chain Taxes Affect Industry

Another recent development that apparently will affect the oil companies less than comparable companies in some other lines is the renewed attack against chain stores, following the United States Supreme Court decision upholding Louisiana's chain store taxes.

Under Louisiana law, taxes are heavier per unit as more units within a chain are involved; and furthermore, in determining the tax per store for a chain, the state may count the units outside the state, as well as within the state. Thus a large national chain would have to pay a comparatively high tax on each unit. The upholding of this tax is expected to lead to adoption of similar levies in other states.

The integrated oil companies or those specializing in refining and marketing have had a direct interest in anti-chain-store legislation; since service stations are retail stores and therefore subject to the taxes, unless exempted by the state legislatures.

Oil Companies Quit Retailing

However, some of the major companies already have found state chain store taxes onerous, and consequently have withdrawn partially or wholly from the retail marketing field. Usually, the companies have leased out their stations to individual operators, and have discontinued the posting of retail prices. The oil companies post tank wagon prices, at which they sell to the dealers. But the retail postings are made by the operators of the stations.

Thus the chain store taxes are causing less concern than formerly, at least for those oil companies that have withdrawn from retail marketing.

Hints for Maintenance of Electric Motors[1]

IT is highly important that a limited number of simple precautions and practices be taken to avoid subjecting the various parts of an electric motor to injurious treatment, and thus procure long, satisfactory performance service.

By J. L. BROWN*

FOR long and trouble free service, electric motors (whether alternating or direct current) require a small amount of regular attention and maintenance. Although an electric motor is not an aggregation of rugged pieces of steel which will resist an unlimited amount of abuse, nevertheless, it is provided with a frame structure that adequately supports and houses the more or less destructible active elements, so that it is necessary to take only a limited number of simple precautions to avoid subjecting the various parts to injurious treatment.

Avoid Overloading

Electric motors are designed to carry certain definite loads as indicated by the horsepower rating on the nameplate and although they are provided with a certain overload capacity to take care of emergency requirements, persistent overloading may result in such an accumulation of heat as to actually destroy the insulation on the coils and conductors. The insulation materials used consist largely of vegetable fibers and resinous gums which at normal motor operating temperatures provide ideal insulation characteristics, but which when subjected to very high temperatures, actually change their chemical composition and become conductors instead of insulators. If, therefore, the load is such as to require a larger horsepower than that indicated on the motor nameplate a larger motor should be used.

Keep Windings Clean

Another common abuse of the insulation of motors is the accumulation of oil or grease upon the windings. This may gain entrance to the motor from adjacent machine parts such as chains or gears, or it may escape from the motor bearings. External sources should be enclosed as by chain housing or gear cases so that lubricant will not be drawn into the motor, and care should be exercised in oiling or greasing the motor bearing to the end that there will be no surplus lubricant to find its way into the motor windings.

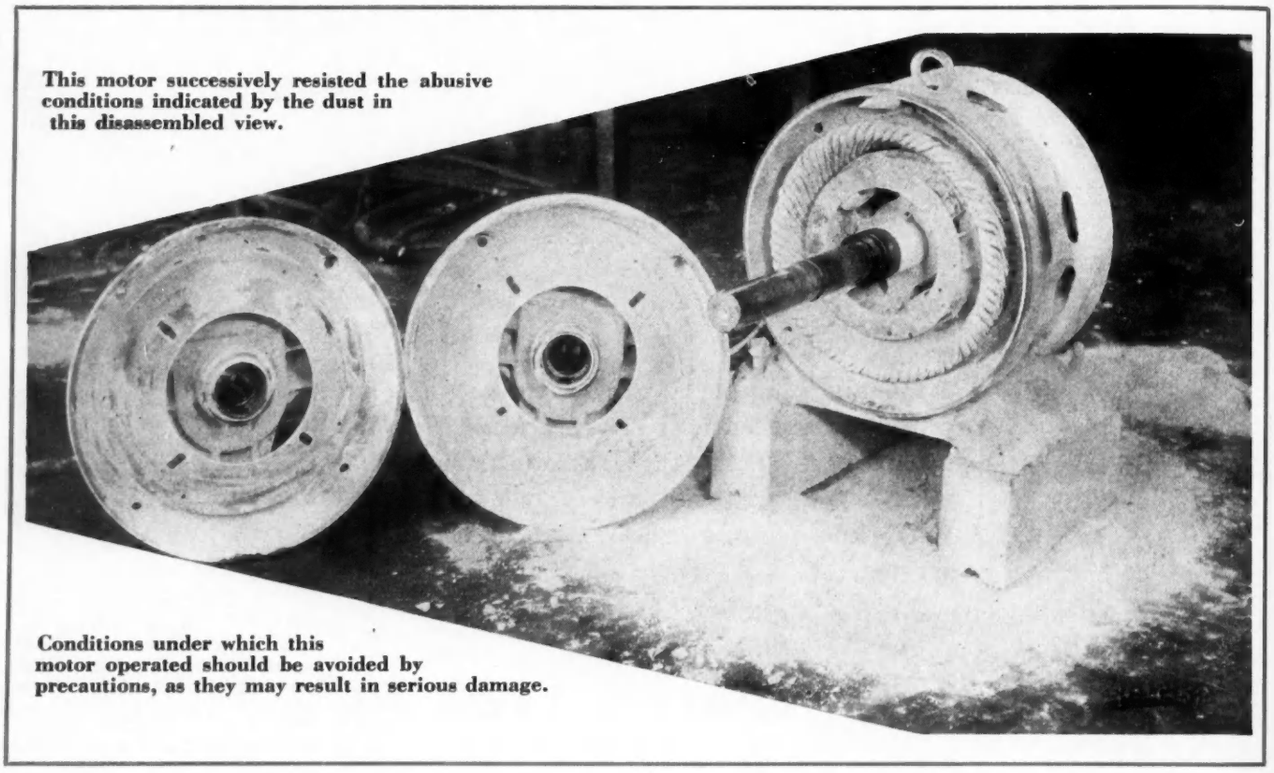
Not only does oil work in amongst the fibers and

*Motor Division, Westinghouse Electric & Manufacturing Company.
[1]Third of a series of "Equipment Care" articles.

layers of insulation and impair its efficiency, but it tends to hold dust and dirt which may gain access to the motor as drawn in by the ventilating air. Especially if this dust is a good electrical conductor, as coal dust or metallic dust, the tendency to insulation failure will be increased greatly. This fact gives added incentive to keep lubricants out of the motor.

Even if oil and grease are not permitted to gain access to the windings or other interior parts of the motor, the presence of conducting and especially magnetic dust in the atmosphere is hazardous to an open motor. This is true to such an extent that in some industries it has been felt necessary to use totally enclosed externally ventilated motors so that such destructive dust may be positively excluded.

It will be appreciated that when a motor is in service the insulation is subjected to a very real force which tends to break through it and destroy its usefulness in much the same way as water pressure in the garden hose tends to burst through and render it unserviceable. The amount of insulation used is ample to resist this force and provide a surplus of capacity to take care of a limited amount of abuse. However, abusive treatment of various kinds tends to impair its efficiency and should therefore be avoided.



This motor successively resisted the abusive conditions indicated by the dust in this disassembled view.

Conditions under which this motor operated should be avoided by precautions, as they may result in serious damage.

While as has been said, the less rugged active elements of motors are so located within the frame structure as to protect them from mechanical abuse, such motors may at times be disassembled thus exposing these parts. Great care should be taken to prevent subjecting the windings thus exposed to blows of a tool or to undue pressure which may crack the insulation which has become dry and hard in service. Scuffing and abrasion of the insulated surfaces should also be carefully avoided.

Wash With Tetra-Chloride

If it becomes necessary to wash the windings to remove oil, oily dirt, or grease which has escaped from the bearings or from adjacent machinery, the use of carbon tetra-chloride is recommended, but gasoline or benzine may be used. Care should be taken that these materials are in contact with the windings as short a time as possible especially if gasoline or benzine is used, and that after washing the windings are thoroughly dried and subsequently sprayed or brushed with air-drying insulating varnish.

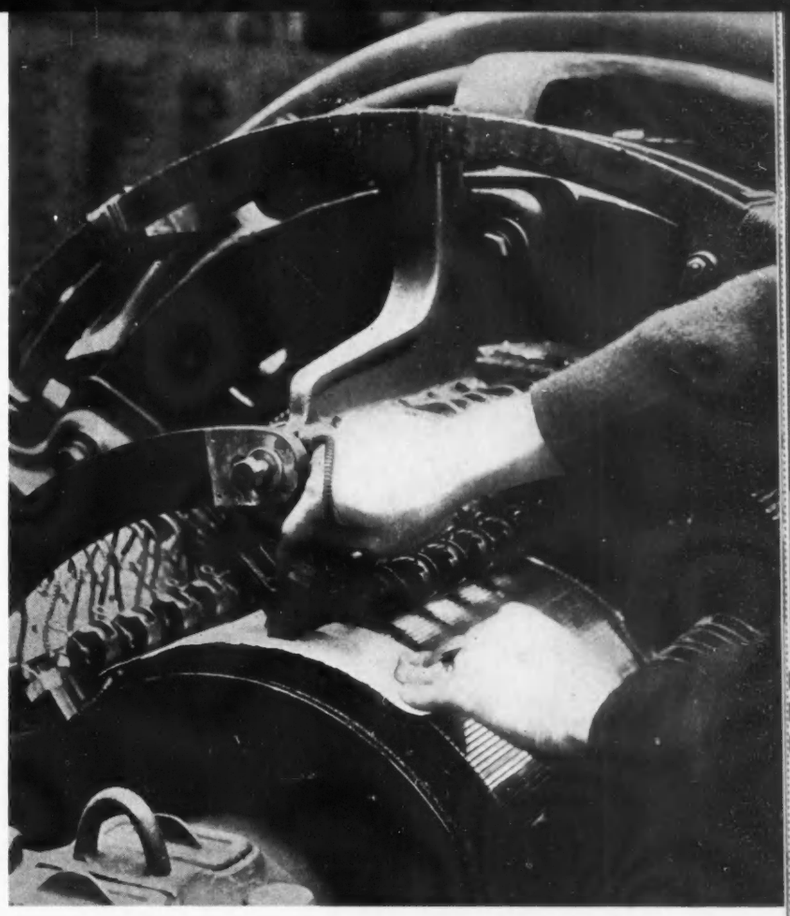
All windings must be tightly held. If through long service or for other reasons coils have become at all loose they should be tightened by wedging or other means which may be provided. If allowed to remain loose, repeated movement will result in chafing of the insulation and ultimate breakdown.

Run on Rated Voltage

Motors should not be connected to circuits of higher voltage than the nameplate reading as the amount of insulation provided may be insufficient to prevent breakdown under the higher voltage. In fact, the voltage on the circuit should be maintained within 10 percent of the nameplate reading of the motor to obtain best performance. Other features of the circuit, also should agree with the nameplate reading, such as whether the current is alternating or direct and if alternating whether it is single, two or three phase and the frequency 25, 40, 50, or 60 cycles.

Keep Current Collecting Parts Smooth

Commutators or collectors if used should be maintained smooth and true and free from oil or dirt. Where the mica of commutators is undercut below the surface of the copper bars the resulting slots should be kept free from dirt and when wear of the commutator necessitates a lathe turning operation to true it up, the original depth of undercutting should be restored by re-cutting. In cases where a minor smoothing operation



New brushes should be installed by an experienced maintenance electrical man for best performance.

is required fine sand paper may be used. Great care should be used in handling to be sure that the brush surface of commutators or collectors are not bruised in any way. To this end they should be protected by a piece of heavy cardboard or fishpaper before being removed from the motor. If they should become bruised it will be necessary to turn them to a true smooth surface in a lathe. Neglect of these precautions will result in unsatisfactory brush operation.

Brushholders should be rigidly secured and brushes should slide freely. Any corrosion or dirt should be removed so that there will be no tendency to sticking of the brushes. Spring actuated brush-fingers should hold brushes firmly in contact with collector or commutator. Two pounds per square inch of contact area of brush with commutator will give good service in the case of ordinary industrial motors and for copper graphite brushes ordinarily used on collector rings four pounds per square inch will usually be found satisfactory.

The rotors of squirrel-cage induction motors are much less subject to damage than wire-wound rotors or armatures nevertheless they should be handled carefully.

The shafts of all these rotating elements are very carefully ground even to within less than one thousandth of an inch variation. It will be appreciated then that any nicking or bruising of the important surfaces such as bearing fits or the surface engaging a coupling will seriously affect their proper functioning.

Fit Couplings Properly

Parts such as couplings or pinions should be fitted carefully on the shaft extension. The press fit alone between pinion and shaft should be sufficient to prevent slipping without the key and then the key added for good measure. Pulleys are usually made a snug sliding fit on the shaft and set screws are caused to engage the outer surfaces of the key. They should be tightened down securely before the motor is operated. Neglect of these precautions will result in wear of the shaft and the coupling also of the key and keyways, which will become progressively worse and may result in shaft breakage or other damage sufficiently serious to necessitate its replacement. If keyway becomes worn it should be recut to a larger size and a larger key used.

Shafts should not be subjected to hammer blows either transversely or axially. If suitable presses or pullers are not available and it is necessary to use a hammer or sledge, a soft metal buffer should be used to receive the hammer blows and transmit the force to the shaft. In handling it is preferable to use non-metallic rope slings around the shaft but if steel cable must be used the shaft should be protected by some sleeve of adequate strength to prevent the steel cable from bruising it.

Do Not Abuse Bearings

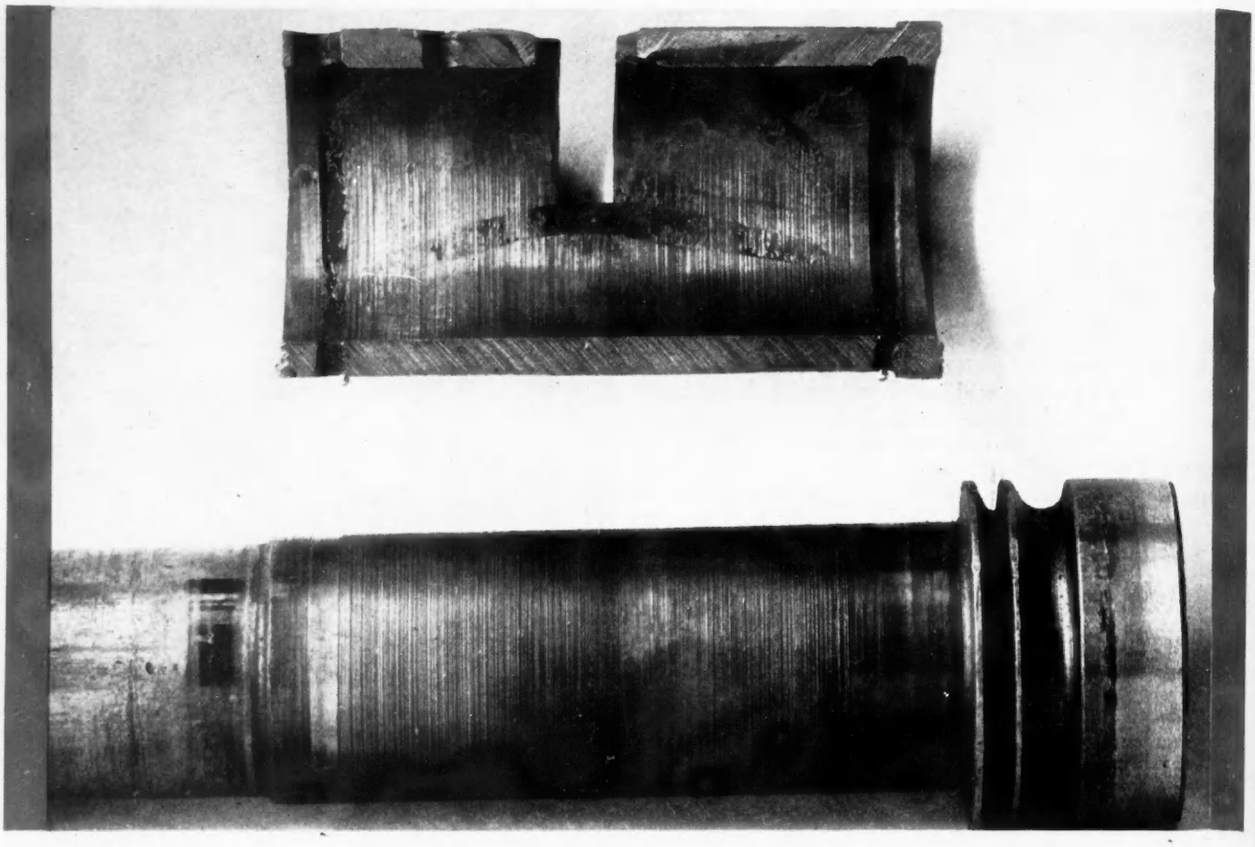
The bearings of electric motors while distinctly auxiliary to the active elements are a most important part of the supporting structure. They also are sensitive to abuse and respond to considerate treatment. Two types of bearings are used in Industrial Motors, sleeve and ball (or roller) and these will be considered separately as follows:

1. Presence of dirt in the lubricant, causing wear of bearing and journal.
2. Improper alignment or excessive shaft deflection.
3. Failure of lubrication on account of incorrect grade or insufficient quantity of lubricant or improper operation of oil ring.
4. Incorrect design of bearing as to adequate bearing area, oil grooving, and structural details.

Over Oiling Often Causes Damage

The oiling of motor bearings is more often overdone than underdone. In bearings commonly used on industrial motors, oil is contained in a reservoir below the bearing and is lifted to the journal by an oil ring large enough to be partially submerged in the oil when suspended from the journal itself. Rotation of the journal causes the ring to revolve, carrying oil from the reservoir to the journal. More oil than necessary to maintain the correct level as indicated by the oil gage will not assist lubrication of the bearing in any way and will be wasted as it escapes through the overflow. Furthermore, part of the surplus oil may pass along the shaft into the motor and be sprayed on the windings by the current of ventilating air, resulting in destruction of the insulation and the expense of rewinding the motor. The rule that oil be added only when a deficiency is indicated by the gauge, should be strictly followed. It is preferable to add oil only through the overflow gauge and then only when the motor is at rest. If oil is added through an opening in the top of the bearing housing, it should be done slowly so that the gauge will have time to indicate, thereby preventing excessive oiling.

Frequent lubrication inspection is probably desirable, but, with properly designed bearings and housings, addition of oil should not be necessary more often than once or twice a year. If a bearing needs oil more often than three or four times yearly the cause of the rapid loss of oil should be investigated and corrected, either



This badly damaged journal and bearing is the result of improper lubrication. It is absolutely essential to good service that motors never be over oiled and that the proper quality of lubricant be used.

by modification of the bearing housings or replacement of the complete motor brackets using interchangeable brackets and bearings of modern design.

For most motor bearings a good quality lubricating oil having a viscosity of about 200 saybolt seconds at 40°C. is satisfactory. More expensive oils of about the same viscosity are satisfactory, but the features that entail the higher cost are not ordinarily necessary for lubricating motor bearings. The oils should, however, be free from sediment, and should not sludge or gum under maximum operating temperatures, which may be as high as 80°C. Heavy oils should not be used as the oil passages are not designed for them.

Watch Bearing Loading

Some bearing failures are caused by overloading. Pulleys, gears, or chain sprockets should be mounted as close to the bearing housing as possible, consistent with proper running clearance. Gears should be meshed accurately, with pitch circles tangent to each other. Chains should have a small amount of slack when running and belts should be tightened only enough to carry the load without slipping. Belt splices should run over the pulleys without thumping. Neglect of these simple rules often results in overloading and failure of the bearings.

One of the most detrimental effects of overloading is shaft deflection. Under load, the shaft in passing through the bearing is slightly bowed, instead of exactly straight. The amount of curvature depends on the magnitude of the load. When this curvature is small it is compensated by different thicknesses of oil film separating the journal from the bearing surface. If the curvature becomes excessive, the oil film may not be of sufficient thickness to compensate for the increased deflection and the shaft makes metal-to-metal contact with the bearing material. At such a contact the local heating becomes high, the bearing metal softens, and is abraided by the shaft. The condition may be so severe that the bearing metal is actually caused to flow at the area of contact. This is called wiping. With suitable bearing materials a small amount of wiping may relieve the condition and avoid further trouble. However, the local heating may be so great that the babbitt actually melts and adheres to the shaft. This stops the motor and the bearing is said to be frozen.

A similar condition occurs, even without load on the shaft extension, if the axes of the shaft and bearing are out of parallel sufficiently to cause the shaft to break through the oil film and press against the bearing metal at certain small areas. Whether caused from overloading or misalignment, this condition can be relieved, if remedied soon enough, by removing the bearing from the shaft and scraping a thin shaving of the bearing material from the areas

affected. It is preferable, however, to forestall this kind of trouble by careful alignment of the shafts.

Increased Temperature Danger Signal

Failure of the oil film at any point in the bearing will be evidenced by a rise in temperature of the whole bearing. The hot spot in the bearing will usually be inaccessible for temperature measurement so that the temperature of the bearing housing or the oil in the reservoir as measured by a thermometer must be used to determine whether or not there is any serious metal-to-metal contact between the journal and the bearing. Expected temperatures of bearing housings depend on the bearing diameter and speed, on the ventilation around the housing, and on the size of the housing as compared with that of the journal. For general-purpose motors, bearing and bearing-housing proportions do not vary greatly so that the values given in Table I can be used as a guide. It should be remembered, however, that on motors having collectors, and especially those having commutators, the bearing adjacent to these parts will often run from 5 to 10 degrees Centigrade hotter than the other bearing because of the relatively poorer ventilation and the proximity of the hot commutator.

If a bearing is damaged by wear, melting, or pounding out of the bearing material, it is always better to replace it by a factory-made bearing, if one is available, as the factory has all facilities for correct manufacturing.

Anti-Friction Bearings Sensitive to Mistreatment

It is a relatively simple matter to obtain very satisfactory service from ball and roller bearings. However, they are sensitive to mistreatment, and, to obtain the best service from them, anti-friction bearings must receive better care than is ordinarily given machinery.

The cardinal point in caring for ball bearings is cleanliness. This does not mean wiping off the bulk of the dirt that collected on the bearing during dis-

TABLE 1

Expected temperature rise of well-ventilated sleeve bearings for general-purpose motors

Shaft Diameter—Inches	SPEED—R.P.M.				
	900	1200	1500	1800	3600
	Degrees C				
1 to 1.75	15	15	15	20	25
Above 1.75 to 2	15	15	20	20	25
Above 2 to 2.25	15	20	25	25	30
Above 2.25 to 2.5	20	20	25	25	30
Above 2.5 to 3	20	25	30	30	35
Above 3. to 4	25	25	30	35	..

Measured by thermometer on the outside of the bearing housing.

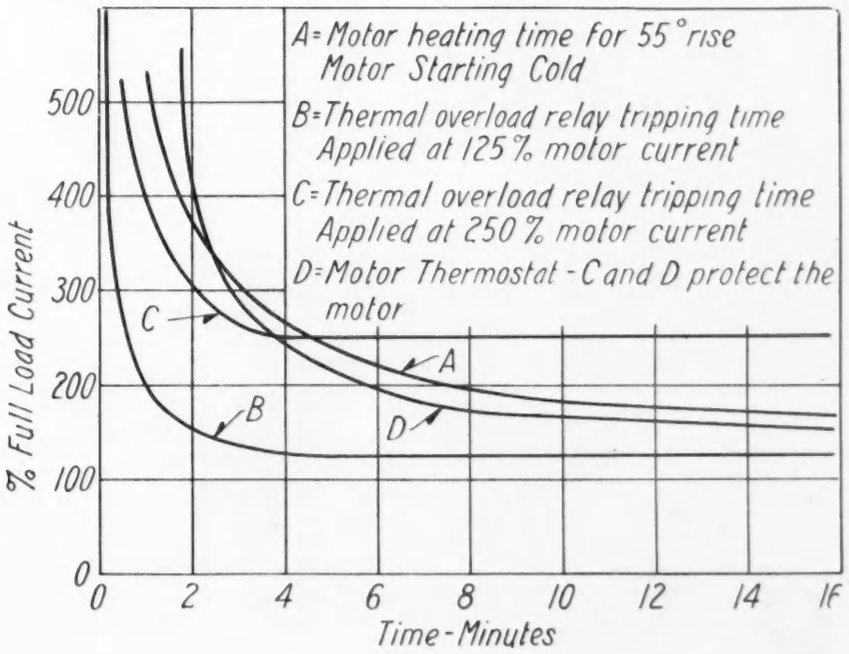
assembly and handling, with a half-dirty rag, as is the usual practice with plain or sleeve bearings. It means such careful handling and protection at all times that there will never be need for wiping dirt off the bearing.

Lubricants should be free from dirt, and, to avoid contamination, should be kept in carefully closed containers. Also grease fittings should be carefully cleaned off before grease is introduced into the bearing housing. When the housing must be removed the bearing should be immediately covered with clean wrapping materials. In no case should an unprotected bearing be allowed to lie on a bench, as even the dust in the air that lodges on the bearing will find its way in among the rolling members.

Easy to Detect Dirt in Bearing

Dirt in a bearing is readily detected by holding the inner race and slowly rotating the outer race by hand. A dirty bearing will give a bumpy or jerky feel to the hand, sometimes diagnosed as flat spots on the balls. Washing the bearing in clean benzine in a clean container will remove most of the dirt, but it is practically impossible to remove all of it. This fact emphasizes the importance of keeping the bearing clean so that it will be unnecessary to attempt to clean it.

Another problem of first magnitude in the care of ball and roller bearings is that of correct lubrica-



Excessive heat cuts months and even years from the life of many motors. Properly adjusted thermal operated relays can safeguard any motor as shown in the curve.

TABLE 2

Suggested greasings at three-month intervals.

Shaft-Extension Diameter, Inches	Weight of Grease to be Added Ounces
¾ to 1¼	¾
1¼ to 1⅞	1
1⅞ to 2⅜	2
2⅜ and over	3

Note:—1 ounce = 1¼ cubic inches.

tion. The major argument used in promoting the substitution of ball bearings for sleeve or plain bearings in general-purpose motors has been their adaptability to the use of grease as a lubricant, as a means of avoiding leakage of oil into the motor with consequent destruction of the windings. Most ball and roller bearing motors therefore are arranged for grease lubrication. The relatively simple seals used are inadequate for retaining oil. However, although the use of grease as a lubricant has eliminated oil leakage, grease leakage has been encountered in some cases, and a train of other difficulties has been introduced through its use. To minimize these difficulties should be one of the important duties of ball bearing maintenance.

Under ordinary conditions a ball bearing motor of average size, say of 15 or 20 horsepower, requires a very small amount of grease, and it is probably safe to say that in the majority of cases many times the amount necessary is introduced into the bearing housing.

With the conventional type of bearing housing it is preferable to establish a greasing schedule based on experience and modified when necessary. This routine should be supplemented at intervals of not more than two years by opening the housings and thoroughly cleansing the bearings, removing all old grease and replacing with a fresh charge.

Overfilling the housing with grease has the distinct advantage of preventing dirt from entering the bearing through the annular clearance around the shaft where it emerges from the housing. The surplus grease will escape at such a place and carry out any dirt that has begun to enter. Where bearings operate at low speeds (900 revolutions per minute or less) so that grease churning will not be an important factor, and the surroundings are particularly dirty, overfilling with grease may prove to be the wisest practice. Where bearing speeds are higher, however, the disadvantages of overfilling become increasingly important.

Rarely does the heat generated by grease churning actually injure the bearing directly. If the lubricant is not caused to deteriorate by the churning or the heating or both, the overfilling will result in no real damage to the bearing itself. However, many greases will not long resist breaking down under these forces. No accelerated test is dependable for insuring that any given grease will not fail in the long run. Grease deterioration is therefore a perpetual menace; therein lies the chief danger of overfilling.

Eleven years of severe, continuous service showed a bearing-wear of less than 15/10,000 inch—Thanks to proper lubrication and intelligent maintenance. At this rate of wear, it is estimated bearing replacement would not be necessary for at least 90 years.

Clean Periodically

The most satisfactory practice for greasing ball bearings is to add a small amount of grease at regular intervals over a period of from one to two years, then disassemble the bearing housings for a thorough cleansing. With the amount of grease additions correctly chosen, this practice will insure sufficient grease at all times and will limit the accumulation in the housing until the clean-out period when the initial condition will again obtain. Table 2 gives suggested amounts of grease to add, which should be modified as to quantity and interval as experience indicates.

To increase the time between overhauls or eliminate them altogether, and at the same time insure the bearing against damage from deteriorated grease, a ball-bearing housing has been produced in which provision is made for disposing automatically of a surplus of grease. New grease is introduced at the side of bearing farthest from the body of the motor. An ample charge will fill the outer space and work its way in among the rolling members, gradually forcing the old grease through a partially restricted escape port during operation of the bearing. In this design generous greasing and removal of discharged surplus grease should make bearing overhaul a rare occurrence.

Use Good Grease

Although it is difficult to insure the satisfactory quality of a grease by specification, it is possible to state several requirements that will rule out a great many

unsatisfactory greases. A good ball bearing grease will be compounded from a pure mineral oil and a sodium-base soap. It should be free from dirt and fillers, such as powdered mica, flake graphite, etc. It should contain no acid or alkali or ingredients that will form these compounds. It should not melt at the highest operating temperature of the bearings, and it should maintain a fairly uniform consistency over a large temperature range. Ordinary cup greases are not satisfactory because they tend to deteriorate.

When grease deterioration has proceeded beyond the early stages, it will be found that such solvents as benzine will not cleanse a bearing from the destructive residue but rather will reduce it to a hard flaky substance that will lock the bearing parts together. In such cases the bearing should be washed in a 15 percent caustic solution until the last trace of soapy residue disappears. Immediately following this the bearing should be transferred to a bath of hot water for removing all caustic solution. The bearing should then fe flushed with kerosene and finally with oil, when it will be ready for further service unless worn or otherwise damaged.

Under normal full-load conditions the pressure per square inch between balls and raceways is high. It is therefore necessary to avoid anything that increases these pressures. Driving on the couplings or pinions should be avoided as far as possible. Parts to be mounted on the motor-shaft extension can be heated sufficiently so that they will slip easily into place and shrink to the shaft with the interference fit required. When such parts are to be removed from the shaft they can be heated to relieve the fit partially and then withdrawn by a puller. If absolutely necessary to drive a pinion or coupling on or off, the shaft should be supported so that the bearings will not have to carry the reaction from the hammer blows.

For the same reason lock nuts should not be tightened with a drift. A spanner wrench should be used in all cases for tightening and loosening.

Removal of bearings by pulling on the outer race will tend to make the balls dent the raceway even though a puller is used. Wherever possible, the pulling means should be applied to the inner end of the inner rotating flinger in contact with the inner race.

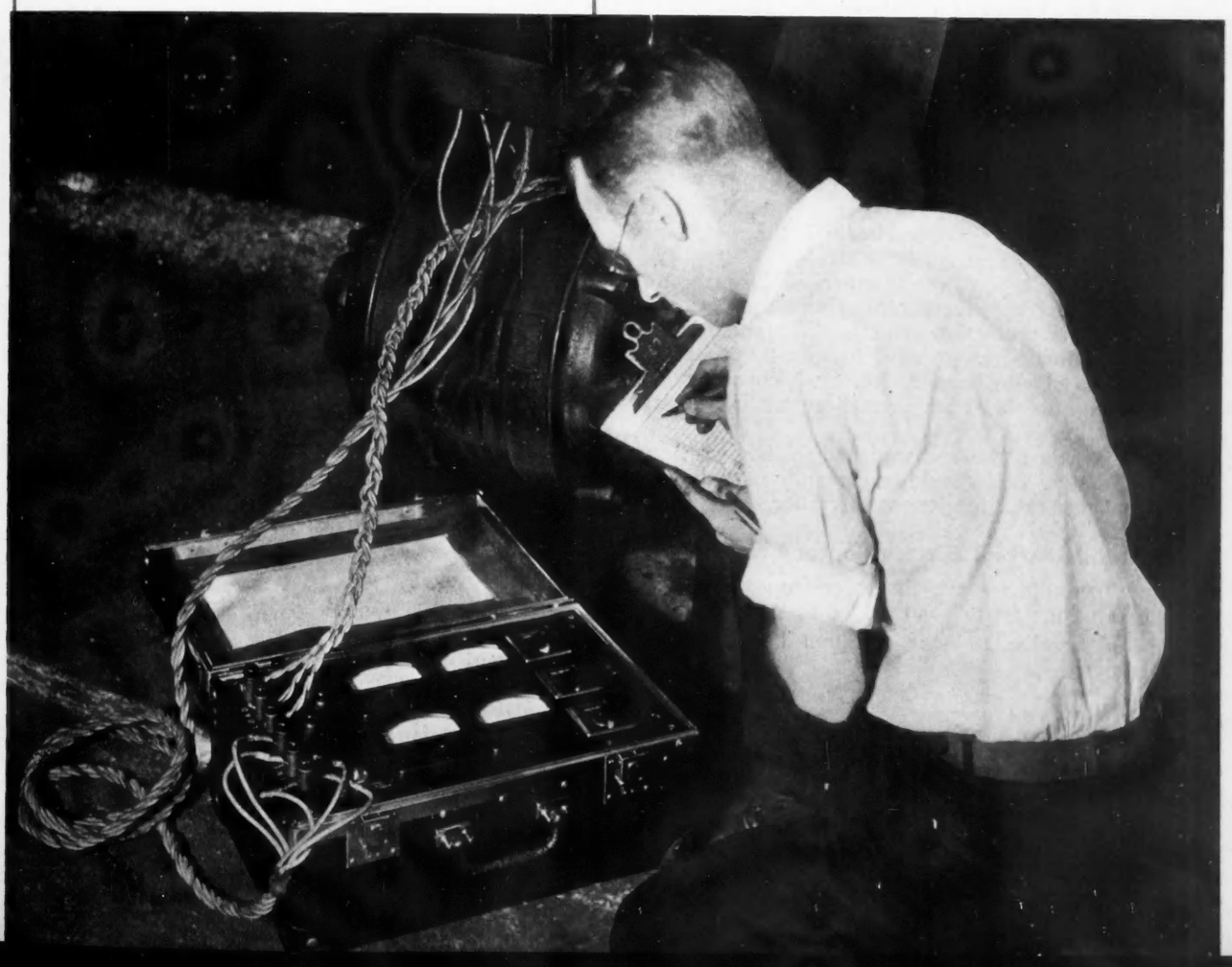
It occasionally happens that a bearing runs short of lubricant or for some other reason becomes so hot as to discolor even the steel balls and races. In such cases it may be found that the inner race has shrunk to the shaft much more tightly than the original press fit. It may even be necessary to cut the bearing off with a cutting flame.

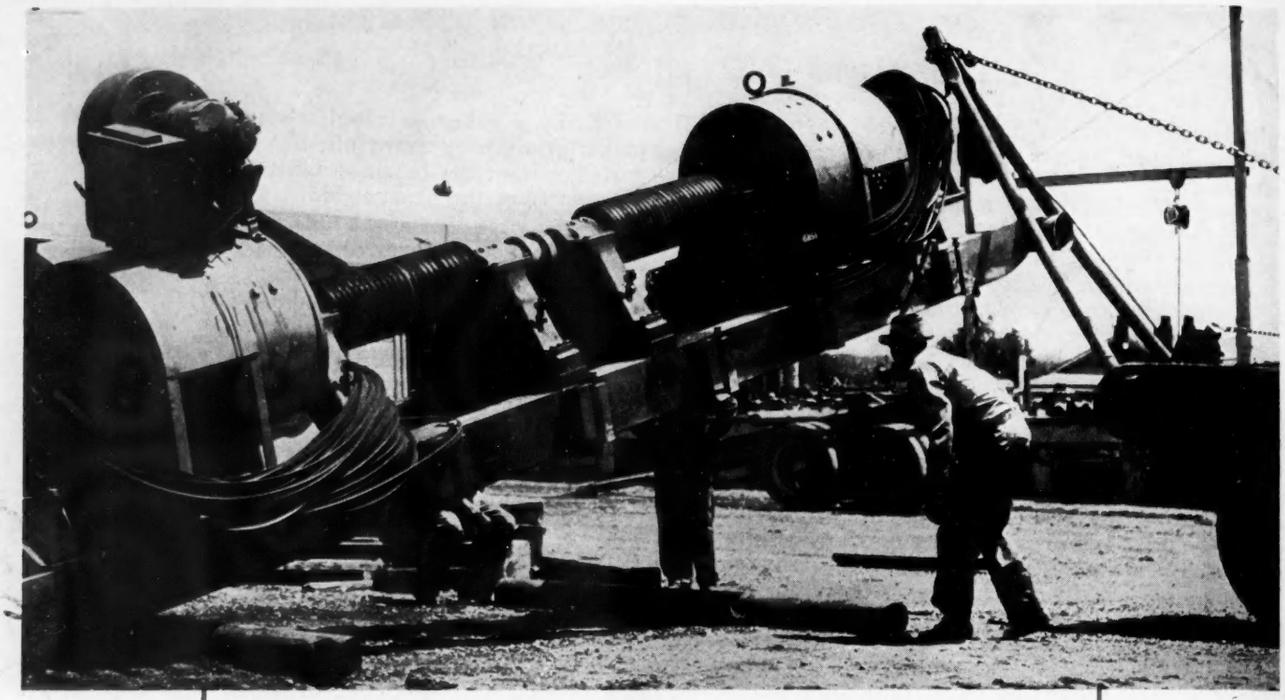
Care in Mounting Bearings

When mounting a bearing on the shaft, it is preferable either to heat it in hot oil to 100°C. and drop it into place and allow it to shrink to the shaft, or to put it on with an arbor press. If neither of these methods can be used and it is necessary to resort to driving the bearing onto the shaft the hammer blows should be taken by a tubular buffer surrounding the shaft and resting against the inner race of the bearing. Great care should be used under such conditions that no metallic chips or particles of any foreign matter get into the bearing.

Motor speeds are, as a rule, considerably higher and the aggregate number of revolutions made during their period of service is much greater than in the case of most other apparatus that employs ball bearings. Accordingly it is necessary for most satisfactory service

Checking upon motors is a quick, simple matter with one of the new analyzer kits. No time required for connecting instruments and no danger of making wrong connections.





Proper handling and inspection of electrical equipment at the time of installation is a big safeguard against excessive maintenance.

to obtain replacement bearings that have the correct internal fit and are otherwise made for motor service. A safe practice is to order replacement bearings from the motor manufacturer or, if ordering from the bearing manufacturer, the order should state that the bearings are to be used for electric motors of the type and speed in question. Carrying of spare bearings is strongly recommended.

Handle with Reasonable Care

In general it may be stated that all parts of an electric motor should be handled with reasonable care. Before being put into service, motors should be securely bolted down on a level surface. Forcing the motor feet down to an uneven surface will distort the frame and may cause rubbing of the rotor or armature on the internal surface of stator core or field poles.

Air passages of ventilated motors should be kept clear and to this end it may be necessary to blow them out with compressed air occasionally if the motors are operating in a dirty atmosphere.

For motors exposed to the weather special protection is required to prevent entrance of rain or snow. Certain types have this protection built in. If standard open motors are mounted in exposed locations, special protecting covers should be provided. Such covers should, however, permit the free normal ventilation of the motor.

A sheet of instructions is furnished shipped with each industrial motor. This should be carefully read and followed and preserved for future reference.

Summary of Electric Motor Care

Summarizing, these are the more important things to keep in mind:

1. Avoid overloading—the resultant heat may char the windings.

2. Avoid getting oil or grease on the windings or other insulated parts—it may cause insulation breakdown.

3. Keep windings and other internal parts free from dust an dirt—particularly conducting and magnetic dust.

4. In case of disassembling protect brush rigging, commutator, collector, windings, bearings and bearing surfaces from damage.

5. When necessary to wash windings use carbon tetra-chloride, dry thoroughly and revarnish.

6. See that circuit characteristics agree with motor nameplate reading before connecting to circuit.

7. Keep commutator and collector ring brush surfaces smooth and true.

8. Keep brushes free in holders and maintain adequate pressure of brush finger on brushes.

9. Maintain proper fit between shaft and parts mounted on the shaft extension.

10. Avoid hammering shafts—use gear pullers or provide buffer to receive hammer blows if puller is not available.

11. Keep bearings and lubricant clean especially during disassembly.

12. Use proper grade and quantity of lubricant—avoid excessive lubrication.

13. Insure proper grade and quantity of lubricant—avoid excessive side pull from belts, chains, etc.

14. Keep air passages clear.

15. In replacements use parts made by the manufacturer of the motor in order to assure proper fit and performance.

16. Carry such spare parts in stock as are recommended by the manufacturer.

17. Follow directions given in instruction leaflet shipped with apparatus.

Reprints of the foregoing article are available at nominal cost. Write The Gulf Publishing Company, Houston, Texas.

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ARMIES—like manufacturers—demand improvement.

Tanks have always been limited in speed, range, maneuverability, life, by the heavy steel tracks on which they traveled. Also, noise of this clanking steel disclosed tanks to the enemy, and was so nerve-wracking to crews that they could neither travel far nor fast.

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THE PRESENT AND FUTURE OF

Pumping

IN THE EAST TEXAS FIELD

By GEORGE L. NYE and E. B. MILLER, JR.,
Tide Water Associated Oil Company

Presented before the East Texas Chapter of the American Petroleum Institute, Division of Production, at Kilgore on May 25.

THE pumping of oil from a reservoir is a function of such importance and involves so many problems that much could be written on any phase of the subject. The purpose of this paper, is to present in a general way, present and probable future methods of pumping oil and the conditions that govern its production.

Field Characteristics

At the present time there are approximately 23,000 producing wells in the East Texas field, of this number some 3525 are now artificially produced and 2429, on which some form of pumping equipment has been installed, but not operated. In other words, 27.2 percent of the total number of wells in the field have already been equipped for pumping, leaving 72.8 percent yet to be equipped at a future date. Already there has been installed such a variety of pumping equipment, that an operator has an opportunity to inspect almost any type equipment he desires, from the most primitive contraptions to the very latest and most improved designs.

It is assumed in this discussion that future methods of determining well allowables will not be based upon the quantity of oil that can be pumped from each well. In the event the procedure for making potential tests should be made similar to that in the Oklahoma City field, where the allowable is based on the quantity of oil which can be flowed naturally or artificially or pumped from each well, much of the equipment now installed in East Texas would be most inefficient and inadequate.

The Woodbine sand is very permeable and porous and readily yields the fluids contained in the reservoir. There are a few localities where there are tight sand conditions and the inflow of oil or water into the well bore is slow; these are for the most part located along the Eastern edge and south part of the field. The sand varies from firm to loose and unconsolidated with a very small amount of cementing material present. The sand varies in size from fine grained sand to coarse pebbles. Although there has been no serious problem in the field as a whole from wells sanding up, there are certain localities, in which the sand is poorly cemented, that are confronted with this problem. It has been necessary in some instances to clean this sand from the hole with a sand pump.

The East Texas field is a typical water drive field and derives its reservoir pressure from the hydrostatic head from the west side of the East Texas Basin. The original pressure in the reservoir was 1620 pounds; at the present time, according to Railroad Commission figures, it is 1170 pounds or a drop of 450 pounds in five years. The level at which the fluid in the hole will stand is in direct relationship to the pressure at the sand face. On the east side of the field where pressure is lowest, the fluid is found to be low and on the west side where reservoir pressure is high, the fluid level is correspondingly higher. These conditions must be taken into consideration when selecting pumping equipment. An east side well, in which no water is present, will flow naturally with reservoir pressures as low as 800 pounds. There is no definite pressure at which a well will cease to flow, but the majority of them are ready to go on the pump when the bottom hole pressure drops to between 800 and 850 pounds.

On the west side of the field where pressures are much higher, from 1000 to 1300 pounds, wells cease to flow because of the presence of water in such amounts that it increases the weight of the column of fluid to such an extent that there is not enough pressure to lift it. The majority of wells on the west side cease to flow naturally when the percentage of water reaches 25 percent to 30 percent.

Natural Division of Field

The physical characteristics of the field are such that for the purpose of this discussion it will be divided into three parts; the West Side, East Side, and Middle or Fairway.

West Side of Field

The West Side of the field has a thick sand section and only the top few feet are oil bearing; the fluid levels are high in this area due to the high bottom hole pressure. As oil is withdrawn from the reservoir the water table rises in proportion. The operator when installing pumping equipment in or adjacent to this water producing area, should take into account two factors: (1) Present rate of oil and water production and, (2) How soon will it be necessary to handle large volumes of fluid in order to obtain the oil allowable?

At the present time, the principal types of equipment being installed in this area are the individual

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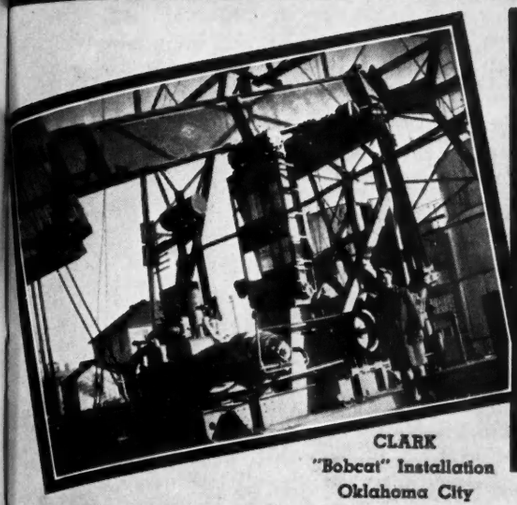

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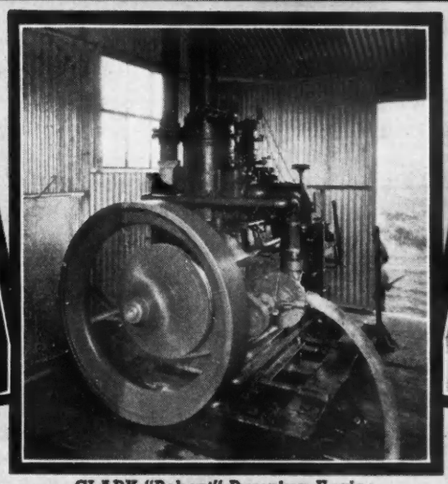

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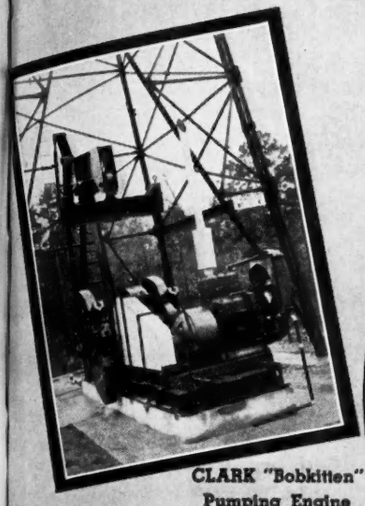

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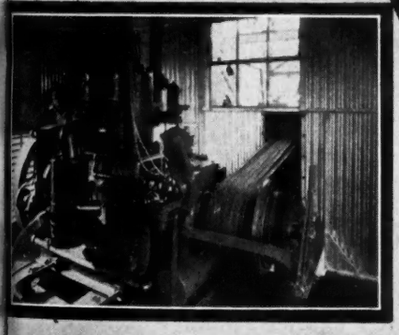

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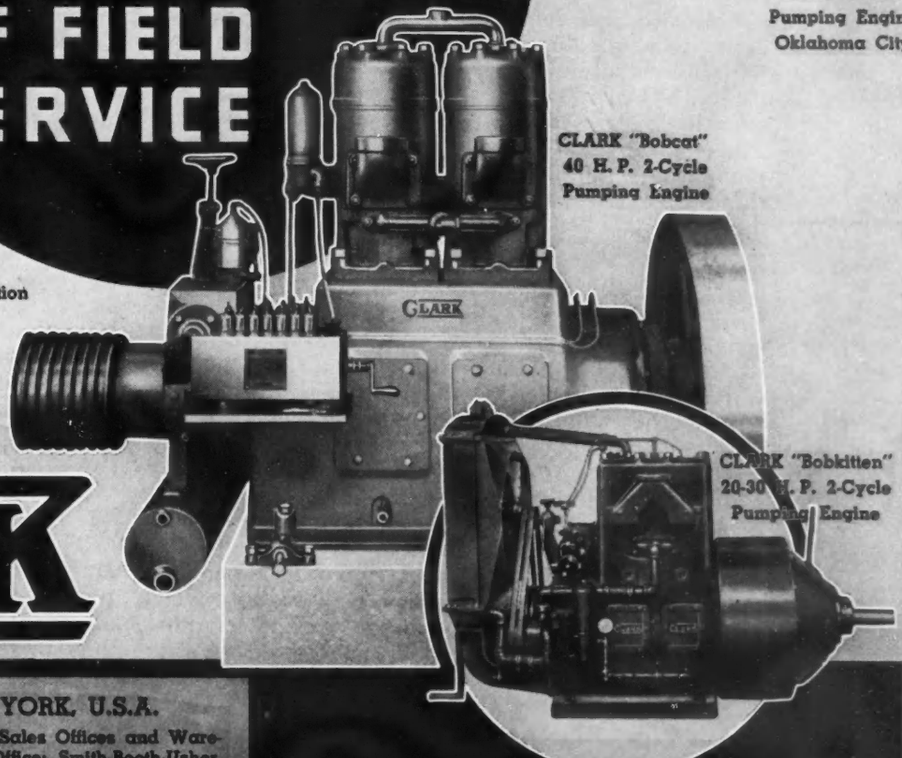

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Further details in 1937 Composite Catalog,
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unit and multiple well hook up, in which two or more wells are pumped by means of back side cranks. The majority of individual units are 30 to 40-horsepower geared type operated by 35 to 45-horsepower engines. A number of companies are, however, installing standard rigs with 40-horsepower horizontal gas engines.

Most of the wells are equipped with 2½-inch tubing, although some companies have standardized on 2-inch tubing throughout the entire field.

The multiple well hook up, as we know it today, is a comparatively new method and is becoming increasingly popular. The determining factor as to whether or not it would be profitable to install this type of equipment is: how soon will it be necessary to handle large volumes of water in order to obtain the well's allowable? As it is necessary to operate a jack at a slower rate of speed and with a shorter stroke than on an individual unit, the amount of fluid that can be handled is limited from 250 to 300 barrels per day. In order to produce this amount it is necessary to operate the machinery near its capacity.

The multiple well hook up is usually installed on the assumption that the jacks will be able to lift the necessary amount of fluid to obtain the wells allowable oil for a period of at least three or four years. In this length of time, the interest on the money saved by equipping two wells with jacks instead of individual units will pay for the installation of these jacks and the depreciation will not be as great as on the larger equipment. Assuming that it cost approximately $3000 to install an individual unit; it would cost $9000 to equip three wells. These same three wells could be equipped for pumping in a multiple well hook up for about $5300, a saving of $3700. In three years, $3700 at 6 percent interest will amount to $666. The jacks could then be replaced with individual units upon which no depreciation had taken place. The cost of installing the jacks would have been paid for by the interest received. For this program to be profitable it is necessary that the interval between the installation and the time when the amount of fluid to be produced exceeds the capacity of the jacks, be determined accurately.

Along the extreme west side of the field the tendency will probably be to replace present equipment with individual units, as soon as it has reached its capacity. When it becomes necessary to handle large quantities of water, as is the case in other Woodbine fields in the East Texas Basin, larger tubing and plunger type pumps or some other pump designed for this purpose, will no doubt replace to a large extent the 2-inch and 2½-inch common working barrel.

The East Side of the Field

The east side of the field is characterized by a thin sand section, low bottom-hole pressure and correspondingly low fluid level, low permeability in some locations, and for the most part an absence of water. It is probable that the equipment in this area will not be called upon to handle large volumes of fluid and that pumping loads will be much less than on the west side of the field. This area is particularly suitable for installation of powers on leases of such a size and shape to be correctly operated. The cost of installing a power is approximately $9000 to $10,000; equipping wells with jacks $700 to $900 per well or an over all cost per well, where 12 or more wells are connected, of $1700. The majority of powers now installed in the field are geared powers operated by 100 to 130-horsepower engines and are located along the east edge although some operators have felt justified in installing central powers along the west flank.

Where individual well units are suitable, a smaller unit is being used than on the west side. Most of these are 20-horsepower geared units operated by 20 or 25-horsepower multiple cylinder engines.

Multiple well hook ups are becoming increasingly popular, especially on leases that are not suitable for the installation of central powers. This type installation is particularly adaptable to six and seven well leases and leases of such shape and topography as to prohibit the use of powers.

The majority of wells in this area are equipped with 2-inch tubing and a common working barrel or insert type of pump.

The Middle (Fairway) of the Field

The middle of the field, or Fairway, will undoubtedly have a long flowing life. It is impossible to draw a line through any portion of the field and state definitely that wells on one side will have west side characteristics and wells on the other side will have east side characteristics. The depth to which the well has been drilled into the oil sand and the success of plug back work will determine to a large extent into which division individual wells will fall. Any given well will cease to flow from one of two reasons; either the bottom hole pressure has declined to the point where it cannot lift the column of oil, or the presence of water is in such quantities that the weight of fluid column is equal to or greater than the existing bottom-hole pressure.

With these factors in mind and the uncertainty connected with them, it is doubtful whether it would be good practice to install any type of equipment until a definite classification can be made.

Surface Equipment

On January 1, 1937, there were approximately 1278 individual pumping units in the East Texas field. These units range in size from 20 to 40-horsepower and are powered by all kinds of prime movers. The individual unit has many advantages, some of which are: adaptability to multiple well hook up, portability, low installation cost, and mechanical efficiency. Gear reduction has become the most popular method of adapting unit to prime mover. These units are for the most part capable of 72-inch stroke and operate efficiently at 24 or 25 strokes per minute. This type unit reduces the size of the house required and eliminates the need of a belt hall.

A number of companies are installing standard rig fronts powered by 40-horsepower horizontal 2- or 4-cycle gas engines. Where belting is required from the prime mover to the counter shaft, V-belt drives are becoming more popular. Endless flat belts with the vertical idler from counter shaft to band wheel are most common and are a decided improvement over the clamp belt. Straight away clutches or stub shafts are being used as take offs from prime mover as most operators plan on servicing wells with portable equipment.

The central geared power is being used more generally throughout the field than the band wheel power. The geared powers are of two types: single and double eccentric, and crank types. The powers vary in size depending upon the number of wells to

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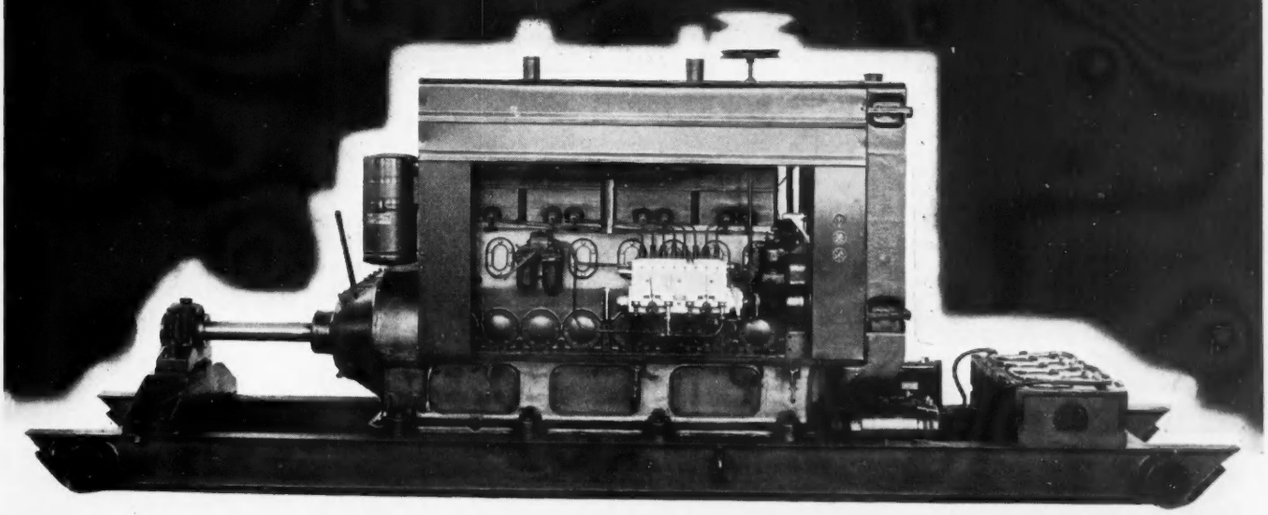

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be handled, but the majority of them are rated at about 100 horsepower. The stroke furnished by the powers varies from 36 inches to 42 inches and are designed to operate at from 12 to 18 strokes per minute. The power is driven from the power take off at the engine by either V-belt or cog wheel drive. Nearly all makes of powers are now equipped with self aligning bearing and weather proof gear unit operating in an oil bath. Prime movers are of multiple cylinder, and horizontal gas engines with some electric motors, but any type prime mover can be adapted to the drive shaft.

There are jacks of many makes and types being used on both the east and west sides of the field. Most of them are equipped with some of straight lift device and are rated from 10,000 pounds to 15,000 pounds beam load capacities. Great improvements have been made in recent years in pumping jacks, much of the power loss due to friction has been eliminated.

Prime Movers

It is impossible to discuss all the various types of prime movers being used in the field as they vary from automobile engines to electric motors. The most popular is the multiple-cylinder type with horsepower ratings from 20 to 40 on units and multiple well hook ups, and 100 to 150-horsepower on compressor and central power units.

A great many used horizontal gas engines have been shipped into East Texas so that it is possible to find almost every make. The majority of new engines being installed are 40-horsepower, two and four-cycle engines.

Electric motors are not used extensively throughout the field although they are becoming increasingly popular. This type equipment probably requires less servicing and replacement than any other type. The accessability of power and the rate are two of the determining factors for this type installation.

Counter Balancing

It is impossible to install a perfectly balanced power, but an attempt should be made to approach this condition as nearly as practical. There are many advantages to be derived from having a power properly balanced, but probably the most important advantage is the reduction of high peak loads. The size engine installed for any pumping well or group of wells should be of sufficient size to properly handle the peak load requirements. By having the equipment properly balanced, the motion throughout the whole cycle is smoothed out and much of the shock to equipment is eliminated. A careful study for the location of the power in reference to the present well locations and future development should be made. After the installation has been made, it is advisable to make tests to determine the efficiency and determine what corrective measures may be made. As an example of the benefits derived from a study of this kind, a lease in West Texas was equipped with a central power to pump 20 wells. It was equipped with a 50-horsepower engine, for the average horsepower requirements under normal conditions were computed to be approximately 40 horsepower. A study revealed that a peak load of 76 horsepower was being developed. By shifting two wells from the day shift to the night shift and putting two from the night shift on the day shift the power was so balanced that a peak load of only 56 horsepower was developed, or 20 horsepower less than former arrangement. This change was made at no additional cost to the operator and yet it will be a material saving to him in the efficiency and life of his equipment.

In balancing multiple well hook ups, the wells are first balanced against each other and then the counter balance weights are so arranged to correct the difference. A recent development has been the counter balanced stroke posts, which make it possible to locate the additional weight necessary in the position it will be most effective. The stroke post also absorbs much of the torque force which would be exerted on the crank shaft and relieve much of the pressure on the crank shaft bearings.

On individual well installations the counter balance should be equal to the weight of the rods plus one-half the weight of the column of fluid and should be so located that as the rods are going down the counter balance will be coming into a top position or to the point of mechanical efficiency from which point on it will help the prime mover handle the load. Counterbalancing has eliminated much of the clutch and bearing trouble previously experienced in these installations. Too much stress can not be placed upon the importance of properly balancing equipment and the benefits to be derived from it.

Pulling and Well Servicing Equipment

In a paper written for the East Texas chapter of the A.P.I. in 1931 by four of the outstanding engineers in the field, much discussion was given to the type of well servicing equipment best suited for the East Texas field. The governing point in their selection of equipment was road conditions or accessibility of the well to portable equipment. Since the roads in the field have been so greatly improved since that time this is not such a vital question.

Swabbing trucks equipped with winches operated from power take-off or by an auxiliary engine mounted on the truck are by far the most common type of servicing equipment. This type equipment has the advantage in that it can easily be moved from place to place and can cover long distances in a comparatively short length of time.

Winches mounted on tractors will be more popular as additional wells go on the pump and its service can be centrally located.

Stationary pulling equipment installations have been limited to isolated wells or wells which require frequent servicing. With the improved power take-off and tractor units there is only occasional need for stationary pulling equipment.

Accessories to Rod Lines

The common practice has been in the past to eliminate all possible equipment such as swings, hold ups and hold downs, multipliers, etc., from the rod line. Many of the objectional features have been removed from this equipment by strengthening their construction and improving bearings. Lubrication systems have also been improved in such a way that a comparatively small amount of friction is developed. In the East Texas field, as well as other pumping fields, swings are being used more frequently to change the direction of pull, so as to more properly balance the load on the equipment. The efficiency gained by having equipment properly balanced far exceeds the loss of power due to friction set up by swings. It is good practice to keep as much

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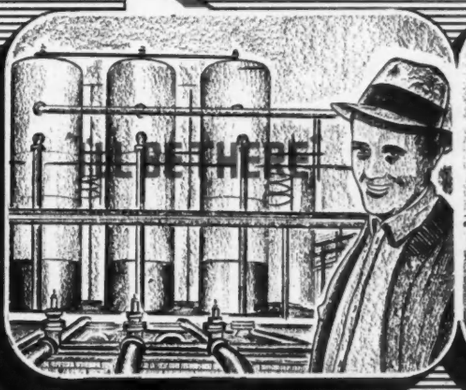


extra equipment out of a rod line as possible but with the improved types they are not objectional if they will more evenly distribute the load requirements throughout the system.

Proper location and alignment are of first importance in installing this equipment. Careful study will very often disclose conditions where a slight sag in the rod line will eliminate the need of a hold down.

There is at least one back side crank unit now on the market that is so designed as to eliminate the need of swings. This unit is operated from the crank by means of a pitman and wells from most any angle may be connected to it. Some of these are now being installed on multiple well hook-ups.

Sucker Rods and Pull Rods

The ¾-inch medium carbon steel rod in 2½-inch tubing, and the ⅝-inch rod in 2-inch tubing, are the most popular in use in the field at this time. The double pin rod has found particular application. As there has been very little trouble encountered from the corrosive effect of the Woodbine water only a few companies have used manganese rods and these are all located along the west side of the field. The majority of rod failures in the field are caused from fatigue, which is in turn caused by the number of reverses or the reversible stresses set up in the rod by pumping.

Crooked holes will no doubt cause serious trouble in later years of the wells' pumping life. The manufacturers of rods are recommending the pin and pin type rod with hardened boxes. This does, however, tend to decrease the wear on the tubing and decrease friction.

Most operators are using ⅞-inch pull rods with wooden doll heads as guides. Fatigue is also the cause for most pull rod failures and is caused by the same forces as in sucker rods. This effect is many times localized and intensified by clamps fitting improperly on the buttons of the rod. The resulting action is similar to bending a piece of wire backwards and forwards until it breaks.

Pumps

The insert or rod pump is being used by a mapority of the operators on the east side of the field. This pump permits the servicing of both the barrel and plunger without disturbing the tubing. There are two kinds of insert pumps, the traveling tube type and the stationary or plunger insert type. Neither type is designed for a capacity pump. In two-inch tubing a 1½-inch bore is the largest size that can be used. A pump of this size operating at 18 to 36-inch strokes per minute and rated at 80 percent efficiency will lift approximately 130 barrels of fluid in 24 hours. A two-inch bore pump is the largest size that can be used in 2½-inch tubing and operating under the same conditions will lift approximately 225 barrels of fluid in 24 hours.

The tubing or common working barrel pump is being used principally on the west side of the field. In order to service this pump completely, it is necessary to pull both the rods and tubing. This pump consists of a plunger working inside of a working barrel which is a part of the tubing string. Many of the insert pumps which are installed on the west side have reached their capacity and are being replaced with this type pump. A bore of 1¾ inches is the largest size that can be used in 2-inch tubing and operating at 18 to 36-inch strokes per minute, and rated at 80 percent efficiency it will produce approximately 184 barrels of fluid per day, or an increase of 41 percent over the insert type. In 2½-inch tubing a 2¼-inch bore is the largest that can be used, and under the same conditions will lift approximately 304 barrels per day, or an increase of 35 percent over the insert type pump. Theoretically, the capacity of any pump should vary directly with the number of strokes per minute and the length of stroke. This is not always the case as there are a great many factors entering in such as over travel and under travel of the plunger, slippage, efficiency, etc.

When it becomes necessary to produce larger volumes of water than the capacities of the above mentioned pumps the operator can install larger tubing which will accommodate larger pumps, use casing pumps, or electrically-driven hydraulic pumps. The casing pump is not designed especially for large volumes of fluid but rather to do away with the necessity of a tubing string. It is so constructed that any type or size pump can be used as long as it does not exceed the size that can be accommodated by the casing. The pump is run on rod string and sealed against the casing by means of a packer, thus using the casing in place of a tubing string.

Summary

In summarizing the present tendencies in the field it may be said that along the west side, individual units and multiple well hook-ups of from 35 to 40-horsepower rating are the most popular equipment and that along the east side multiple well hook-ups and powers are preferable.

The future tendencies will necessarily vary with the new and improved type of equipment that will no doubt come on to the market. Long stroke pumping will probably have an important place in future production methods. New types of long stroke units are being built that permit greater rod travel thus reducing the number of reversals and also more output per inch of polish rod travel because the proportion of stroke lost by stretch is reduced.

The history of other Woodbine fields and the conditions on the extreme west side of the field, at the present time, forewarns us of the most vital problem we will have to contend with: namely, the production of large quantities of water in order to obtain the wells' allowable.

It is difficult to ascertain the amount of trouble that will be encountered from abrasive action of sand, but it is almost certain that considerable trouble will be had especially on wells where a thick sand section has been exposed and large volumes of fluid are to be withdrawn.

Paraffin is and will continue to be a problem in producing oil especially where flow rates and pumping speeds are slow. Proper methods and precautions should be taken to prevent the separation of paraffin and retard its accumulation. Through periodic cleaning by a mechanical method and injection of a paraffin solvent into the well no severe condition should be experienced.

It must be remembered that much of what has been said about the future conditions and problems of the East Texas field and the sufficiency of pumping equipment which has been installed and is being installed, depends upon the regulations promulgated by the railroad commission.

GENERAL CONDITIONS IN THE

East Texas Field

By W. S. MORRIS, Field Chairman,
East Texas Engineering Association

The first part of a symposium on the East Texas field held by the East Texas Chapter of the American Petroleum Institute, Division of Production, at Kilgore on May 25. Parts 2 and 3 also appear in this issue.

THE East Texas oil field occupies a unique position in the oil industry in that it is the largest developed oil field in the world from the standpoint of the number of acres in the field, the number of producing wells, the potential of the field, the amount of oil produced to date, and the known oil reserves. The East Texas field as of January 1, 1937, contained approximately 137,800 productive acres on which had been drilled 22,332 wells; these wells had a total one hour open flow potential of 13,360,482 barrels and had produced, up to the same time, a total of 961,495,135 barrels of oil according to reports of the United States Bureau of Mines. The remaining oil yet to be produced from the field is estimated to be approximately 2,750,000,000 barrels.

Figure 1 is a map showing the comparative size of the East Texas oil field with other major oil fields in the United States; all the fields on this figure are drawn to scale. It may be seen from Figure 1 that the East Texas field, approximately 42 miles long and four to eight miles wide, containing approximately 211 square miles, includes such a vast area that the Hobbs field in New Mexico, the Seminole and Oklahoma City pools in Oklahoma, the Kettleman Hills field in California and the Yates and Hendrix pools in Texas, can be contained within its boundaries. Table 1 shows the development of the East Texas field from January 1, 1931, up to and including January 1, 1937.

From this table it can be observed that the well density has steadily decreased to 6.17 acres per well, notwithstanding the original 20-acre well spacing plan of the railroad commission subsequently modified to a 10-acre spacing. In certain parts of the field, particular in townsites, the number of acres per well is very much smaller than indicated by the table. It has been estimated that of the 22,000 wells in the East Texas field that 16,000 (72.7 percent) were exceptions to the 10-acre spacing plan promulgated by the railroad commission.

Geology

The East Texas field is producing oil from the Woodbine sand found at an average depth of 3650 feet in the field. The top of the Woodbine sand is found generally at 3540 feet on the east side of the field and 3850 on the west side. The structure is a monocline type as shown by the generalized west-east cross section in Figure 2.[1] The Woodbine sand structure is a part of the East Texas geo-syncline and is a continuous sand body from the outcrop west of Dallas to the East Texas field where it pinches out against the west flank of the Sabine Uplift. The formation, in general, is a broad wedge of sand and sandy clay, which is thickest at the outcrop, thins southeastward and extends beneath the surface 120 miles east and west and 150 miles north and south over an area of at least 18,000 square miles.[2] The portion of the Woodbine sand from which oil is produced in the East Texas field consists of the truncated section as shown in Figure 2.[1, 3] The sand is effectively sealed and completely covered by the Austin chalk which rests unconformably on top of it. The oil bearing part of the Woodbine sand lies between the depth of 3050 feet below sea level on the east edge of the field, where it pinches out, and 3320 feet below sea level; this depth being the estimated original water level in the field. The west dip of the top of the Woodbine sand is very gentle; the dip at Kilgore being about 50 feet per mile and about 25 feet per mile in the northern section of the field. The area of the field originally underlain by water is approximately the west half of the field with an area of approximately 62,400 acres. There are portions of the field east of the water contact line where wells are, at this time, reported as producing bottom-hole salt water.

For a detail discussion of the geology of the East Texas field, it is suggested that reference be made to the literature cited in the bibliography at the end of this article.[2, 3, 4, 5, 13]

Well Spacing

It has been estimated that on account of the favorable sand conditions in the Woodbine formation in the East Texas field that one well to every 20 acres properly spaced and with production scientifically allocated, would result in a recovery of approximately as much oil as would take place under 10-acre, 5-acre, 2-acre or even 1-acre spacing.[6] On the basis of 137,800 acres in the field and 20-acre spacing, it would indicate that 6890 wells would adequately drain the pool. As of January 1, 1937, Table 1 indicates that there had been 22,332 wells drilled in the field, which is 15,442 more wells than required to drain the reservoir. If the average cost per well were $10,000 the 15,442 excess wells represents an excess investment of $154,420,000, others have placed the excess cost at $162,000,000.[14, 15] Even on the basis of one well to 10 acres, the present spacing rule of the railroad commission, the 22,332 wells still represent an excess of 8552 wells, which, at $10,000 each, represents an excess cost of $85,520,000 to the industry.

During the year 1936, the records of the railroad

commission indicate that 2475 wells were drilled in the field. This is a monthly average of 206 wells. Of these wells, 685 were drilled outside of the proven limits of the field as of January 1, 1936. During 1936 it has been estimated that 5100 additional productive acres were added to the field, which, on the basis of one well to twenty acres would have required 255 wells, indicating an excess in 1936 of 430 wells. It is estimated that during 1937 there will be drilled 1800 wells in the East Texas field

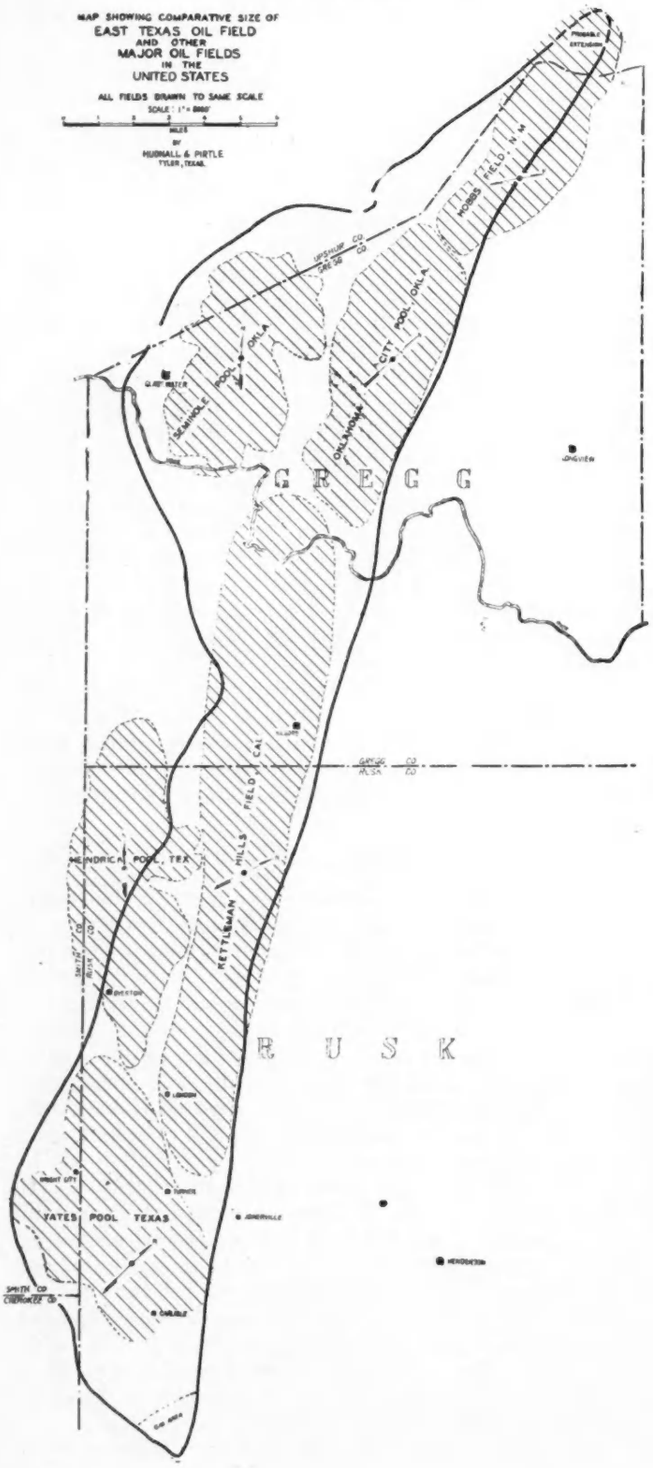
TABLE 1

Development—East Texas Field

DATE	Number Wells	Estimated Productive Acres	Average Well Density Acres per Well
January 1, 1931	30	.....	.....
January 1, 1932	3,612	92,000	25.47
January 1, 1933	9,372	105,000	11.20
January 1, 1934	11,891	116,000	9.76
January 1, 1935	15,507	124,000	8.00
January 1, 1936	19,552*	132,700	6.79
January 1, 1937	22,332*	137,800	6.17

* January 1, 1936 figures include 304 abandoned wells.
* January 1, 1937 figures include 322 abandoned wells.

FIGURE 1



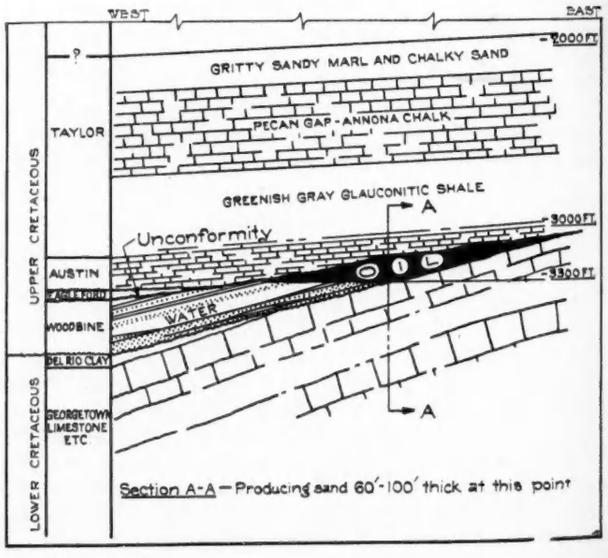
the majority of which will be in excess of the number required to adequately drain the pool.

Reservoir Conditions

The Woodbine sand as mentioned herein is a continuous sand body from the outcrop to the East Texas field. The sand is porous and holds water throughout its extent, and it serves all the structures within its province more or less alike.[2] The porosity of the sand has been found, by a number of investigators, to be an average of 25 percent. The permeability is very high and has been reported to be on the average between one and two darcies. The oil produced from the Woodbine sand is about 40° A.P.I. gravity (0.825 specific gravity) of greenish black color and intermediary base; the gasoline content is 36 percent with an octane value of 57, which percentage may be increased by cracking up to as high as 65 percent gasoline.

The oil in the reservoir is under-saturated with gas at the pressure originally in the reservoir; in fact it has been determined that there is no free gas in the reservoir, except in the extreme south end of the field. The gas starts coming out of solution at a pressure of 755 pounds per square inch absolute.[7] It has been found that there are 365 cubic feet of gas in solution per barrel of oil at a reservoir pressure of 755 pounds and a temperature of 146° F., when expanded to atmospheric pressure and a temperature of 90° F. The shrinkage in the oil when the gas is released and the temperature lowered amounts to 20

FIGURE 2



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DOWN STROKE

Note that half of each rubber has raised above stationary half . . . allowing an area for fluid passage larger than the area of flow around the A. P. I. pin.

UP STROKE

Note that movable half of each rubber has dropped back beside its other half. Rubbers now in swabbing position.

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due to unique

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SAFER: Gas pressure will open split-rubber permitting gas to by-pass, resuming its load without loss after gas has passed. No loose line over derrick floor to endanger crew.

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percent. This means that a barrel of oil in the reservoir measures 0.80 barrels in the lease tanks.

The temperature in the reservoir has been found to be 146° F.[1, 7, 8] This temperature in the reservoir checks closely with some earlier observations and calculations in northeast Texas.[2] The average reciprocal gradient for East Texas was found to be about 1° F. increase per 50 feet of depth. Applying this factor to the temperature of 71.76° F. found at 100 feet in Amerada Petroleum Corporation's Wade 1, Upshur County, the calculated temperature at the depth of 3843 feet, where water was found, would be 146.6° F. The reservoir temperature in the East Texas field has been generally accepted as being between 140 and 150° F.[9]

The thickness of the oil bearing portion of the Woodbine sand varies in the East Texas field from zero on the east side to more than 100 feet in the middle, to zero on the west side of the field. Reistle[1] estimated the average thickness to be 47 feet, of which 35 feet were considered of sufficient porosity and permeability to yield oil.

Based on 137,800 productive acres and 35 feet of 100 percent saturated sand, there would be 4,823,000 acre feet of sand; with a porosity of 25 percent this reservoir would hold 9,354,208,500 barrels of fluids. If these fluids were all oil and dissolved gas, the total amount of oil, measured in lease tanks, would be 20 percent less than this total, or 7,483,366,800 barrels. If it is further assumed that the recovery will be 50 percent of the oil in place then the recoverable reserve would be 3,741,683,400 barrels. Of this amount, there has been produced up to March 1 1937, a total of 988,180,135 barrels (U. S. Bureau of Mines figures), leaving a balance of 2,753,503,265 barrels yet to be produced. The methods to be used in obtaining the oil yet in the reservoir, is the subject of this discussion.

TABLE 2

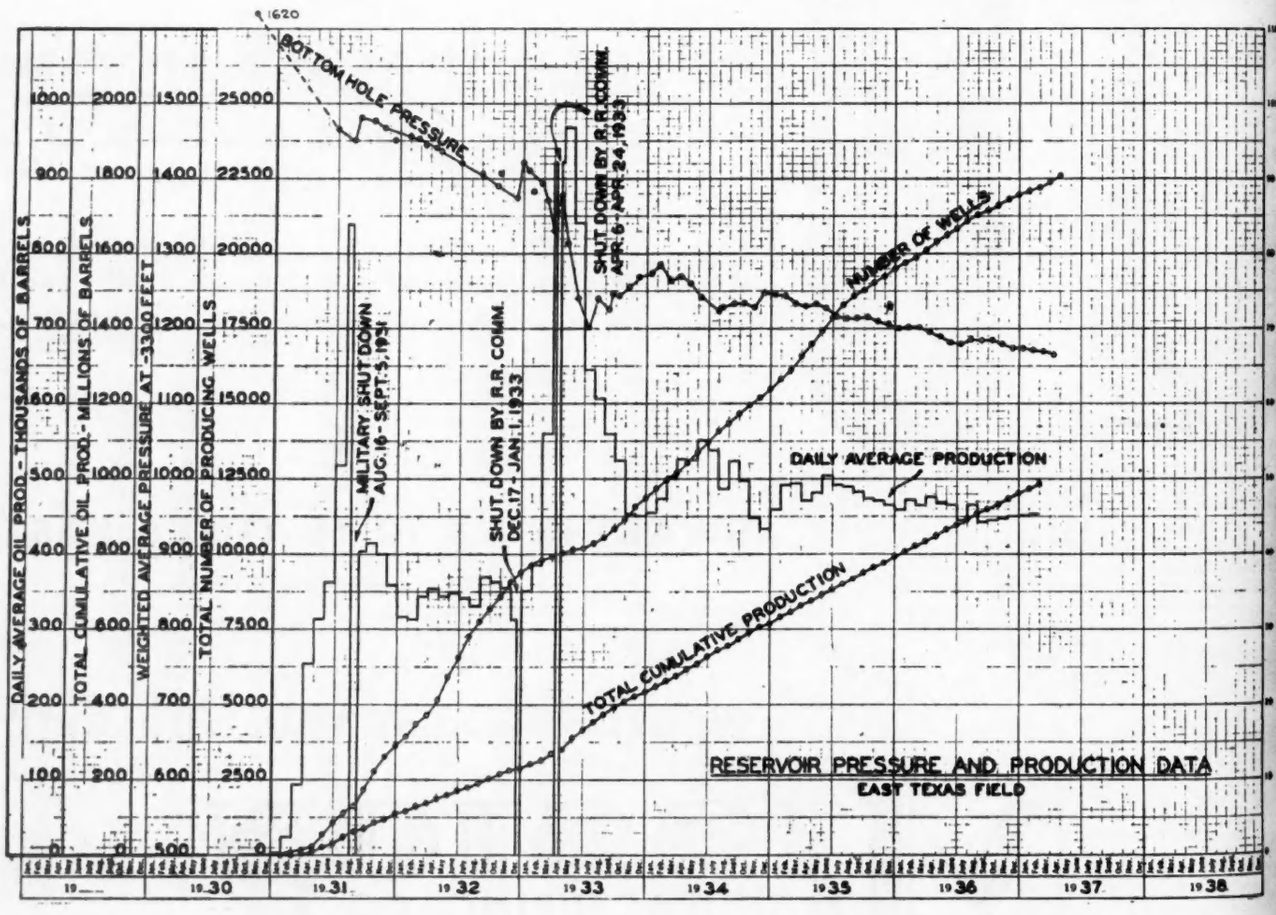
Classification of Wells in East Texas Field by Potential

Potential Range	Number of Wells	Percentage of Field	Total Potential	Percentage of Field	Average Potential per Well
0– 100.....	1,053	4.72	66,870	0.49	64
100– 200.....	1,644	7.37	260,846	1.91	159
200– 300.....	1,868	8.37	480,951	3.53	257
300– 400.....	1,665	7.46	649,600	4.77	390
400– 500.....	1,943	8.71	881,043	6.47	453
500– 600.....	1,727	7.74	963,440	7.08	558
600– 700.....	2,237	10.02	1,471,893	10.81	658
700– 800.....	2,327	10.43	1,770,520	13.00	761
800– 860.....	2,323	10.41	1,925,386	14.14	829
Total Marginal Wells..	16,787	75.23	8,470,549	62.20	505
860– 900.....	1,595	7.15	1,411,738	10.37	885
900– 950.....	2,154	9.65	1,992,985	14.63	925
950–1000.....	1,592	7.14	1,550,474	11.38	974
1000–1050.....	132	0.59	134,467	0.99	1,019
1050–1100.....	49	0.22	52,475	0.39	10,71
1100–1150.....	5	0.02	5,544	0.04	1,109
Total Potential Wells..	5,527	24.77	5,147,683	37.80	931
Total Field...	22,314	100.00	13,618,232	100.00	610

Oil Production

Figure 3 is a graph which shows the average daily oil production, by months, from the beginning of the field, up to and including February, 1937. The cumu-

FIGURE 3


1620
BOTTOM HOLE PRESSURE
SHUT DOWN BY R.R. COMM. APR. 6 - APR. 24, 1933
MILITARY SHUT DOWN AUG. 16 - SEPT. 5, 1931
SHUT DOWN BY R.R. COMM. DEC. 17 - JAN. 1, 1933
NUMBER OF WELLS
DAILY AVERAGE PRODUCTION
TOTAL CUMULATIVE PRODUCTION
RESERVOIR PRESSURE AND PRODUCTION DATA
EAST TEXAS FIELD
DAILY AVERAGE OIL PROD. - THOUSANDS OF BARRELS
TOTAL CUMULATIVE OIL PROD. - MILLIONS OF BARRELS
WEIGHTED AVERAGE PRESSURE AT -3300 FEET
TOTAL NUMBER OF PRODUCING WELLS
1000 2000 1500 25000
900 1800 1400 22500
800 1600 1300 20000
700 1400 1200 17500
600 1200 1100 15000
500 1000 1000 12500
400 800 900 10000
300 600 800 7500
200 400 700 5000
100 200 600 2500
0 0 500 0
19__ 1930 1931 1932 1933 1934 1935 1936 1937 1938

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lative production, the number of wells, and the reservoir pressures for the corresponding period are also shown. The production figures were taken from United States Bureau of Mines reports and the pressures and number of wells from the Engineering Department of the Railroad Commission at Kilgore, Texas.

Table 2 shows the classification of wells in the East Texas field on the basis of potential. With the allowable percentage fixed at 2.32 percent of the hourly potential, wells in the field with a potential of less than 860 barrels per hour would be in the marginal well classification and receive up to an allowable of 20 barrels per well per day. The table indicates that there are 16,787 such wells representing 75.23 percent of the total number of wells in the pool. These marginal wells represent a potential of 8,470,549 barrels which is 62.20 percent of the total field. The average potential of all of the marginal wells is shown to be 505 barrels.

The largest potential wells in the field are between 1100 and 1150 barrels per hour. There are five of such wells in the field with an average potential per well of 1109 barrels. It may, therefore, be seen that the best wells in the field secure an allowable of approximately 6 barrels per day over and above the marginal well allowable.

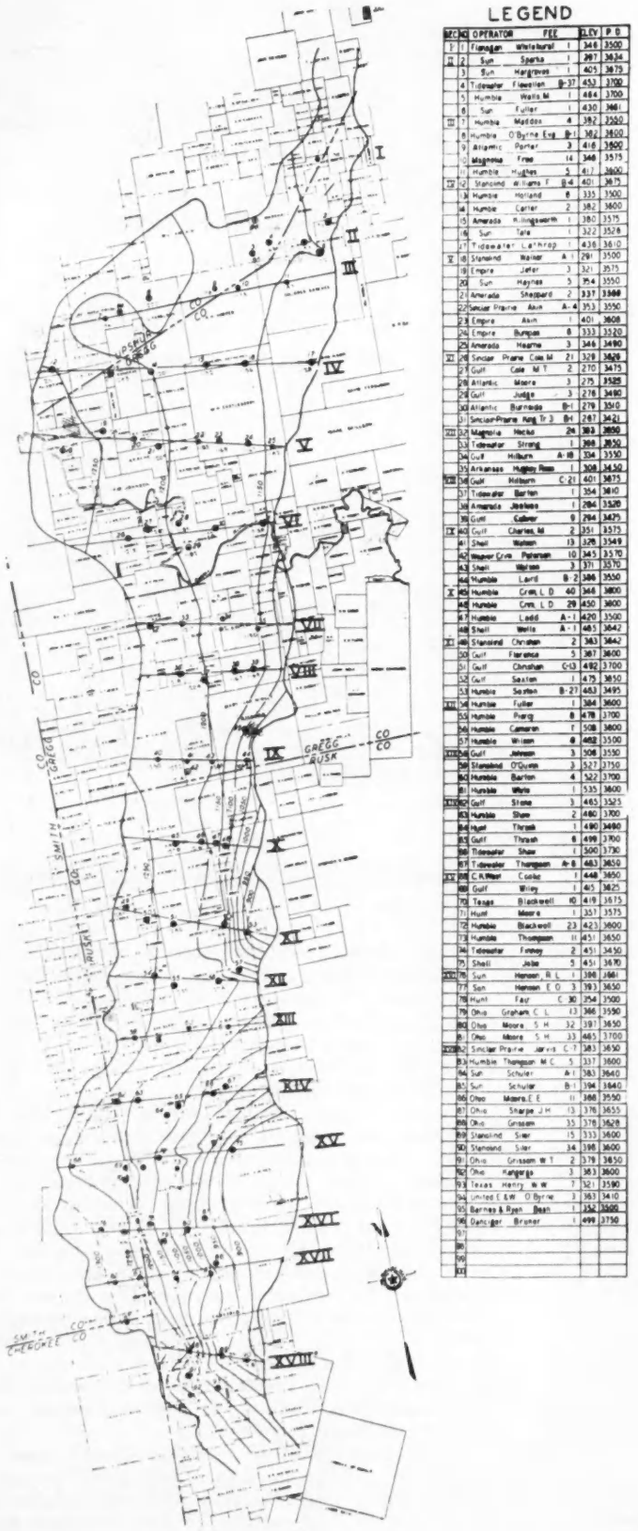
The table indicates that there are 5527 potential wells in the field, which represent 24.77 percent of the total number of wells. The potential wells have a total potential of 5,147,683 barrels or 37.80 percent of the total of the field.

TABLE 3

Decrease in Reservoir Pressures with Oil Production East Texas Field

YEAR	Oil Produced U. S. B. M.	Drop in Reservoir Pressure	
		Pounds	Pounds per Million Barrels
1930	27,135	...	.....
1931	109,561,000	160	1.460
1932	121,449,000	40	0.329
1933	204,954,000	150	0.732
1934	181,540,000	24	0.132
1935	175,918,000	40	0.227
1936	168,046,000	30	0.179
1937*	26,685,000	6	0.225
Total	988,180,135	450	0.455

* 1937, January and February only.



Reservoir Pressures

The reservoir pressure in the East Texas field was originally believed to be 1620 pounds.[1, 8, 10, 11, 12] The decline in the reservoir pressure compared with the oil production is shown in Table 3, which indicates a total decline of 450 pounds per square inch, or 0.455 pounds per million barrels of oil produced to March 1, 1937.

The weighted average pressure in the reservoir at 3300 feet below sea level as of March 12, 1937, was 1,161.44 pounds per square inch as shown in Figure 4 (data from railroad commission). From this map it will be seen that the pressures on the west side of the field are much higher than on the east side and that the pressures are rather uniform north and south throughout the field. The pressure gradient west to east in the field increases from the north to the south.

For example—on the west-east section No. IV north of Gladewater, the pressure varies 122 pounds across the field from 1251 pounds (key well No. 12) to 1129 pounds (key well No. 17). On Section No. IX just south of Kilgore, the gradient increases to 171 pounds across the field from 1230 pounds (key well No. 40) to 1059 pounds (key well No. 44). The

FIGURE 4

Concentrated CONTROL-

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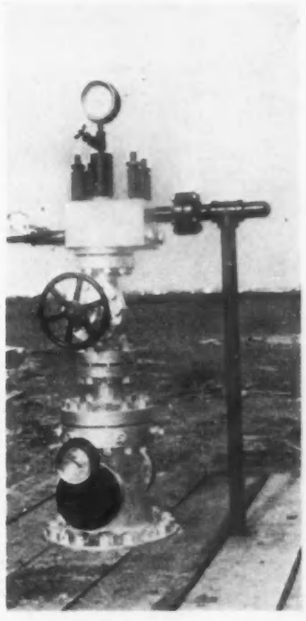
A Christmas Tree and a Flow Line Manifold all in one



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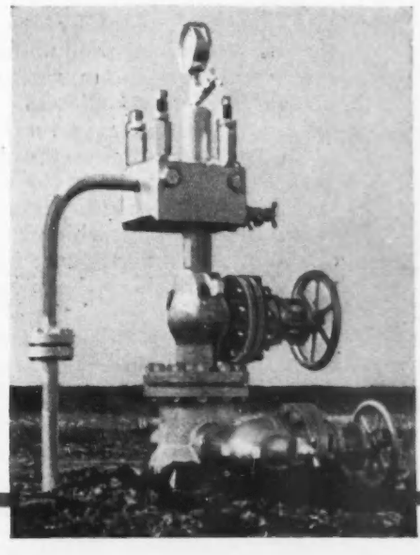

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of a series
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gradient further increases as we go south: Section No. XV, north of Joinerville, shows a drop of 374 pounds from 1246 pounds (key well No. 68) to 872 pounds (key well No. 75).

For a detailed discussion of the effect of different production rates on the pressure distribution in East Texas, the reader is referred to the literature cited in the bibliography.[12]

The reservoir pressure of the East Texas field is affected materially by the rate of production from the reservoir. Figure 3 shows that the reservoir pressure has declined irregularly: the curve indicates clearly that the decline in pressure has been more rapid at the higher rates of withdrawal. Conversely, the pressure has increased in the field in general, when the rate of production has been reduced. Thus it may be observed that in April, May and June of 1933 when production was in excess of 900,000 barrels per day, the pressure dropped rapidly (from 1370 pounds on March 10, 1933, to 1220 pounds on July 12, 1933) and was checked only when the production rate was considerably lowered. Other changes in the reservoir pressure with different rates of production may be observed from Figure 3 and found in the literature.[1, 10, 11, 12]

The fact that the reservoir pressure did not continue to decline as more oil was produced, as would be consistent with the expansibility of the oil left in the reservoir undersaturated with gas—indicated that some extraneous force was acting on the reservoir. This force has been investigated and found to be the encroachment of water from the west. The mechanism of the movement of the water has been reported by Schilthins and Hurst.[10] Briefly, the water does not move from the outcrop of the Woodbine sand into the East Texas field, but rather gradually expands into the field from the surrounding area as oil is withdrawn from the reservoir and pressure within it declines below the pressure in the water saturated portion of the Woodbine sand. The Woodbine sand has been estimated to contain roughly four trillion barrels of water, and if the pressure on such an enormous quantity of water were lowered only 50 pounds per square inch, it would expand and supply enough excess water to fill the space left by all the oil produced from the East Texas field to date (October, 1934). Data on the field indicate clearly that water drive on water encroachment is by far the most important agency in maintaining the reservoir pressure or in producing the oil. The effect of the decline in pressure in the East Texas field has been calculated to extend at least 10 miles out in the Woodbine sand.[10]

There is a maximum rate of water encroachment into the field, fixed by the frictional resistance of the sand. If the oil production rate in the field is kept below this maximum rate of water intrusion, the pressures in the field will be sustained, but if the oil production rate is increased above the critical point, the water pressure head will begin to log with the consequent rapid decline in reservoir pressure within the field. Should the drop in pressure reach the point at which gas in liberated from the oil, 740 pounds per square inch gauge,[7] the reservoir would lose much of the valuable lifting energy contained in the gas, and the oil left in the sand would be more viscous and consequently more difficult to flush from the sand body.

The proper production rate for the field has been suggested at 450,000 barrels per day.[10, 12] This allowable figure has been exceeded since the latter part of January, 1937, not including the water production which is estimated to be approximately 50,000 barrels per day. The performance of the reservoir under this rate of fluid withdrawal is being closely observed.

TABLE 4

Summary Wells Equipped for Artificial Lift

Equipment Installed for Artificial Lift	No. Flowing Wells	No. Pumping Wells	Total No. Wells	Percent	Percentage Installed and in Operation	
					Jan. 1, 1936	Jan. 1, 1937
Standard Rigs.....	688	582	1,270	21.3	37.5	45.8
Pumping Units.....	472	806	1,278	21.5	45.3	63.1
Back Side Cranks...	288	756	1,044	17.5	55.2	72.4
Wells Connected to Central Powers....	964	1,006	1,970	33.0	35.6	51.1
Gas Lift.....	17	293	310	5.3	94.4	94.5
Equipment Unknown	0	82	82	1.4	....	11.5
Total Field.....	2,429	3,525	5,954	100.0	44.4	59.2

Production Methods

As of the first of the year 1937, there were 27.2 percent of the wells in the field equipped for some form of artificial lift. Many wells are equipped with pumping units in anticipation of the day when natural flow will cease. During the middle of 1933 when the pressure decline was so rapid, many operators rushed pumping equipment into the field which has not as yet been used. Table 4 is a summary of wells equipped for artificial lift, and shows that 40.8 percent of wells equipped for pumping are still flowing.

Acknowledgments

The author is indebted to the Engineering Department of the Railroad Commission at Kilgore, Texas, for much of the data on pressures in the reservoir and other statistics; also to the officers of the East Texas Engineering Association for permission to publish this paper. The statements and opinions expressed herein are those of the author personally and should not be construed in any respect as the opinion of the East Texas Engineering Association.

Bibliography

[1] Reistle, C. E., Jr. "East Texas Production," A. P. I. Drilling & Production Practice, 1935, pp. 96-105.

[2] Plummer, F. B., and Sargent, E. C., "Underground Waters and Subsurface Temperature of the Woodbine Sand in Northeast Texas," the University of Texas Bulletin No. 3138: October 8, 1931.

[3] Zavoico, Basil, "Geology and Economic Significance of East Texas," World Petroleum, March, 1936.

[4] Lahee, F. H., "The East Texas Oil Field," A.I.M.M.E. Pet. Dev. & Tech. pp. 279-294, 1932.

[5] Levorsen, A. I., "The East Texas Oil Field," Inst. Pet. Tech., Vol. 8, No. 7, pp. 261-268, June, 1931.

[6] Report of the Sub-Committee of nine on "Evils Attending Unnecessary Drilling in Proven Fields, and the Remedy," Independent Petroleum Association of America, Oklahoma City, Okla., Dec., 1936.

[7] Lindsley, B. E., "A Study of 'Bottom Hole' Samples of East Texas Crude Oil," U. S. Bureau of Mines, R. I. 3312, May, 1933.

[8] Reistle, C. E., Jr., and Hays, E. P., "A Study of Subsurface Pressures and Temperatures in Flowing Wells in the East Texas Field and the Application of These Data to Reservoir and Vertical Flow Problems," U. S. B. M., R. I. 3211, May, 1933.

[9] Reistle, C. E., Jr., "Paraffin Production Problems," A. P. I. Drilling and Production Practice, 1934, p. 72.

[10] Schilthuis, Ralph J., and Hurst, William, "Variations in Reservoir Pressure in the East Texas Field," A.I.M.M.E., Pet. Dev. & Tech., 1935, pp. 164-176.

[11] Nye, G. L., and Reistle, C. E., Jr., "Recent Changes in Reservoir Pressure Conditions in the East Texas Field," A.I.M.M.E., Vol. 107, Pet. Dev. and Tech. (1933).

[12] Reistle, C. E., Jr., "Effect of Different Production Rates on Pressure Distribution in East Texas," A.P.I. Dallas, Nov. 15, 1934.

[13] Minor, H. E., and Hanna, M. H., "East Texas Oil Field," Bull. A.A.P.G., 1933, Vol. 17, pp. 757-793.

[14] Knowlton, D. R., "The Future of Well Spacing," The Oil Weekly, Vol. 85, No. 10, May 17, 1937, page 51.

[15] Bays, George S., "Comments Made on 'The Future of Well Spacing'," The Oil Weekly, Vol. 85, No. 10, May 17, 1937, page 54.

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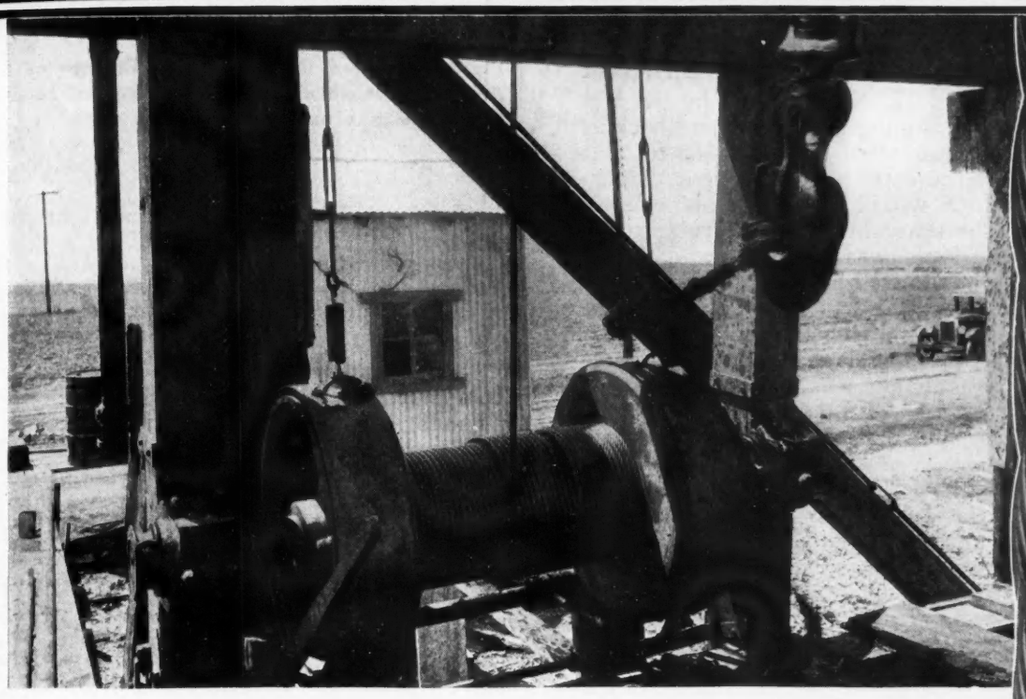

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THE USE OF

Gas-Lift and Flow Valves

IN EAST TEXAS FIELD

By RILEY A. AUCOIN
Humble Oil & Refining Company

GAS-LIFT and the functions of pressure and pressure differentials have been known to the oil industry for many years. This is evidenced by the fact that many patents pertaining to gas-lift date back as far as 1910, and some were issued prior to that time. Engineers of the earlier days thought of gas-lift as a force which would cause the oil level to drop in the annular space between the tubing and casing when such force was applied between the tubing and casing at the well head, causing the fluid to rise inside the tubing and to be produced in the same manner as natural-flowing production. In such cases, of course, comparatively high input pressures were necessary. No thought was given at that time to bottom-hole pressures or the effects of the gas-lift pressures upon the main reservoir. Then came the special "foot pieces" or attachments for the tubing with which various lengths of tubing strings could be run and the wells made to flow with lower casing pressures and fairly good mixtures of gas and oil. The length of tubing strings were of course dependent upon the working fluid level in the wells and no thought was given to large gas volumes.

The so-called "flow valves" began to make their appearances previous to 1930, but they were at that time considered good for only a transition stage between flowing and pumping. Until 1933, no serious consideration was given to the possibility of carrying producing wells to depletion with flow valves, or the intermittent injection of gas at various levels in tubing strings.

The great East Texas field presents one of the most interesting gas-lift prospects known to aspirants of this form of oil production. By the time this field was started, engineers had learned that complete well records were essential to solve problems which would be presented later in the life of the wells. Consequently, sand conditions and subsurface pressures were recorded during the first well completions, and extended to the present time. With a knowledge of permeabilities and porosities or the productivity of the sand, which gives drop in bottom-hole pressure under flowing conditions, together with a knowledge of the weight of a given column of the crude, the gas-lift engineers have only to search for equipment to meet each well's conditions. These engineers also have many other conditions favorable to this form of production. The wells are of medium depth, and the short lengths of lift permit induction of gas of lesser volume per barrel of fluid produced and at low pressures where slippage is reduced because of the lower pressures and greater velocities. This reduces paraffin accumulations which have always troubled operators when artificial-lift equipment is used in fields producing light paraffin-base oils.

Presented before the East Texas Chapter of the American Petroleum Institute, Division of Production, at Kilgore on May 25.

With such a wealth of available information in store, it is only natural that some of the engineers would think of gas-lift as a means of producing wells of this field, but all were at first hesitant to make such recommendations. When one of the major companies started gas-lift attempts in the East Texas field, in March of 1933, many thought this would be only another noble experiment. The old conventional "straight gas-lift" was first tried, with attempts to produce a given quantity of oil (under proration) with a maximum of 300 pounds pressure. It was soon found that when the tubing was submerged to a depth great enough to produce the given quantity of oil, fluctuating fluid levels would cause the wells to become "fluid bound" at intervals; and they had to be swabbed into production.

The use of smaller strings, 1¼-inch inside of 2½-inch tubing, and one-inch inside of two-inch tubing, with gas introduced between the two strings, and producing through the small string, met with the same failure as the larger strings. Better success was obtained when small perforations were introduced into the small flow strings at various levels but large volumes of gas were used, and paraffin accumulations soon made this practice prohibitive. Attention was then turned toward the possibilities of controlling the gas volumes admitted at the various levels. This presented a problem for which there seemed at first to be no solution, but development along these lines has taken place at a rapid pace during the last few years; and this has led to the real beginning of the use of "Flow Valves in the East Texas field."

Kick-Off Valves

The first of these valves to make its appearance was the so-called kick-off valve, of which there were two outstanding types, (Figure 1 and Figure 2) the "ball type" and the "side button type." The "ball type," Figure 1, consisted of a small ball in a tube having predetermined clearance for the ball, and seats at each end. This tube was fitted to the outside of a nipple so that the lower end would be open to the casing gas; and the upper end opened into the tubing. These valves were spaced at dis-

tances approximately 300 feet apart in the flow string. While the well remained shut in, the weight of the balls kept them on the lower seat. When the tubing was opened, the pressure immediately lowered inside the tubing, thereby causing gas to move through each valve until a differential of approximately 20 to 30 pounds was reached; which differential could be varied with the clearance and ball weight. The balls then seated against the upper seats, shutting off the casing gas at the points at which the valves were located. The upper valves, reaching the pressure differential first, would be the first to close; and the remaining valves would close in succession going downward in the well. This usually caused the fluid column to be sufficiently lightened to make the well continue to flow under its own pressure. After the balls of these valves seated against the upper seats, they would not open again until the pressures were almost equalized in the casing and tubing. This valve is referred to as Valve "A."

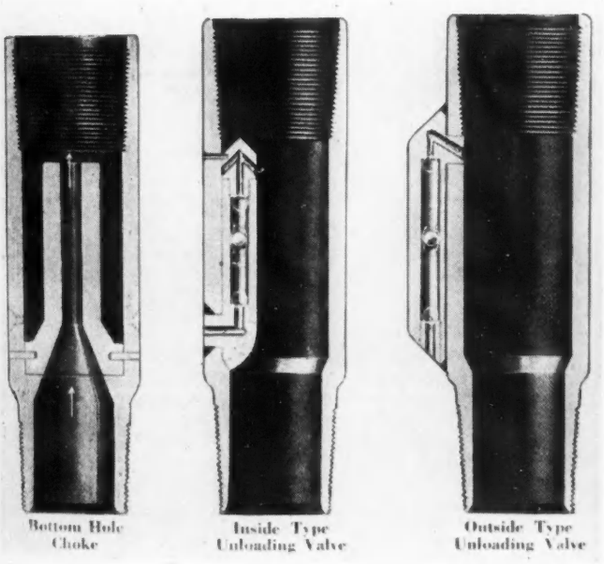
The "button type" kick-off valves, Figure 2, consisted of a semicircular steel button attached to a piece of flat spring steel, approximately 2½ inches long and one-half inch wide. The steel spring was attached to a nipple at one end and to the button on the other end. The button seated in a port in the side of the nipple. The spacing of the nipples in the tubing string was similar to that of the "ball type" valves. The springs of the valves served to keep the buttons away from their seats, thereby necessitating an opposing pressure differential across each valve sufficient to close it before the casing gas would discontinue passing into the tubing column. The pressure differential at which these valves would open and close depended upon the tension in the springs and the port sizes. The cycle of operation of these valves is similar to the "ball type" valves. This valve is referred to as Valve "B."

Inside-Type Fluid-Controlled Valves

There are many different makes of valves which might come under this heading, but for the purpose of this paper we will consider only those tested extensively in the East Texas field.

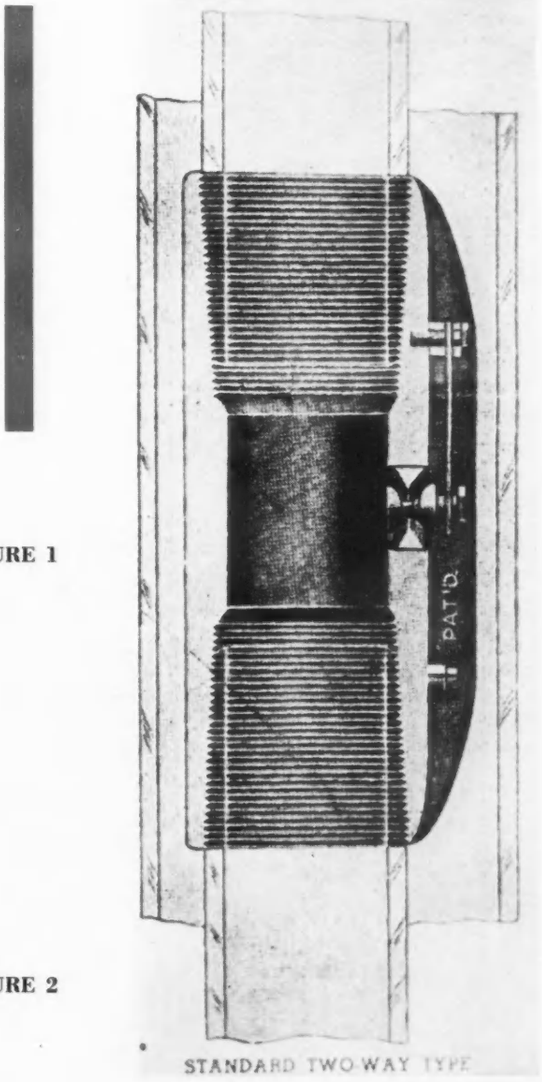
The inside-type valves referred to as "C," Figure 3, consist of a small plunger with two seating enlargements and a flat disc on the lower end. The plunger fits into a small chamber with two seats ground to fit the seating enlargements of the stem so as to make a balanced valve. This complete assembly is fitted inside of a nipple, with a port drilled through the nipple and connected to the tube between the two valve seats. The disc is on the bottom side of the assembly. After spacing these valves at different levels in the flow string and introducing gas into the annular space, movement of the fluid column will start inside the tubing. As this fluid passes the disc on the lower end of the valve stem, its velocity forces the stem upward against the two seats, shutting out the flow of casing gas. The velocity of the gas through the valve also assists in closing it.

When these valves were first used in East Texas, they were evenly spaced from the surface downward and all the valves were identical. This type of setting produced very nicely at first while fluid lev-



Left:

FIGURE 1



Right:

FIGURE 2

els were high; but as the fluid levels dropped, excessive gas volumes resulted. Valves were then placed at a greater distance from the surface without first determining the approximate static fluid level. These installations were failures because the upper valves were too deeply covered with fluid. New developmnets on this type of valve, Figure 4, introduced a variety of different cross sectional areas, with varying sizes of discs, so that all upper valves could be made to close more quickly and the lower valves remain open longer. With the use of eight to thirteen of the new-type valves in each well, good results were obtained. Some of these settings remained in the wells more than two years before being pulled.

The "D" valves, Figure 5, were introduced in East Texas at the time when wells started dropping rapidly in bottom-hole pressures, and many wells required frequent swabbing. This valve may be called a semi-stage-lift valve. It consists of a nipple, which serves as a tubing attachment, and a sleeve for the fluid-actuated-sliding mechanism inside. The inside mechanism consists of close-fitting hollow plunger with a venturi tube in the lower end and a flapper check in the upper end. The upper end of the plunger is recessed so that gas may pass in through a port when the inside mechanism reaches its lower seat. As fluid passes through the valve, the plunger is forced upward against a seat and the ports are closed. Whenever the movement of the fluid stops in the tubing, the plunger drops downward and the check valves stops the downward movement or slippage of the fluid. At this time the ports are opened and gas is permitted to pass up through the oil to lighten it and cause movement thereby forcing the plunger upward.

These valves were at first spaced evenly in tubing strings, as in the case of all early valve settings, but it later developed that better success could be had by spacing the valves nearer each other in the working fluid levels, and increasing the valve distances above and below the working levels. Some of the settings of these valves performed satisfactorily for more than two years.

The "E" valves, Figure 6, consist of a close-fitting plunger in a heavy casting. The plunger has a hollow center, fitted with a small ball check valve in the upper end, and has small holes from the center hole into a recess around the close fit between the casting and plunger. Gas ports drilled through the casting fit perfectly into the plunger recess when the plunger is in its lower position, thereby permitting gas to pass from the casing to the center of the plunger and into the tubing column. The plunger has an enlargement at the upper end which seats and prevents fluid from dropping downward when fluid upward motion stops. Fluid passing through the valve forces the plunger upward and closes the gas

FIGURE 3

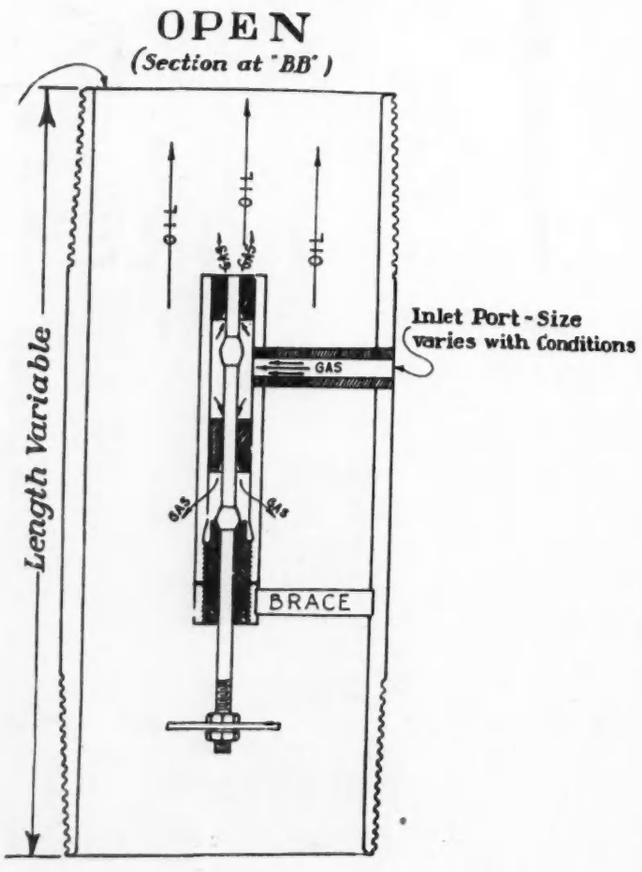


FIGURE 4

VALVE DIMENSIONS & DIFFERENTIALS

TYPE	SEAT DIAM.-64THS	AREA-SQ.IN.	200# "Tubing-400# "Casing"	
A	15 Seat 16 Stem 16½ Seat 17½ Stem	0.0438 0.0491 0 0530 0 0595	[redacted]# UP 3.14	1.56# DOWN
			Net [redacted] force - 1.58#	
B	15 Seat 15½ Stem 16½ Seat 17 Stem	0 0438 0.0466 0.0530 0.05548	2.33# UP	2.56# DOWN
			Net Down force - 0.23#	
C	15 Seat 15½ Stem 17 Seat 17½ Stem	0.0438 0.0466 0.05548 0.0595	3.14# UP	3.55# DOWN
			Net Down force - 0.41#	
XC	15 Seat 15½ Stem 17 Seat 17 Stem	0.0438 0.0466 0.05548 0.05548	Net Down force @ 400#C-200#T 1.40# At 400#C-300#T = 0.15# At 300#C-200#T = 0.34#	
D15	15 Seat 17 Stem	0.0438 0.05548	11.19# UP	17.52# DOWN
			Net Down force - 6.33#	
D16	16 Seat 18 Stem	0.0491 0.0621	12.42# UP	19.64# DOWN
			Net Down force - 7.22#	
D17	17 Seat 18 Stem	0.05548 0.0621		

REMARKS

D16 Valve has a down force of 1.01 at 300# Tubing and 400# Casing

D16 Valve BALANCES with 315# Tubing & 400# Casing

D17 Valve has a down force of 0.46# at 350# Tubing and 400# Casing

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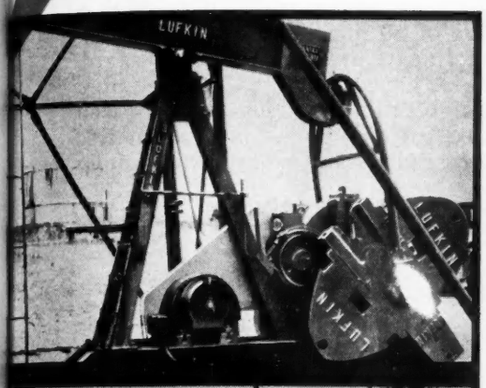

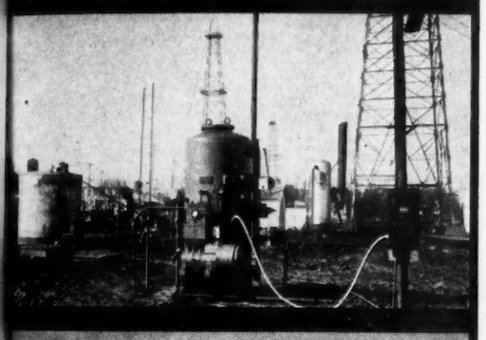

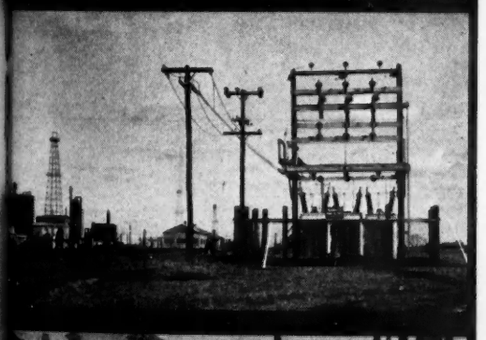

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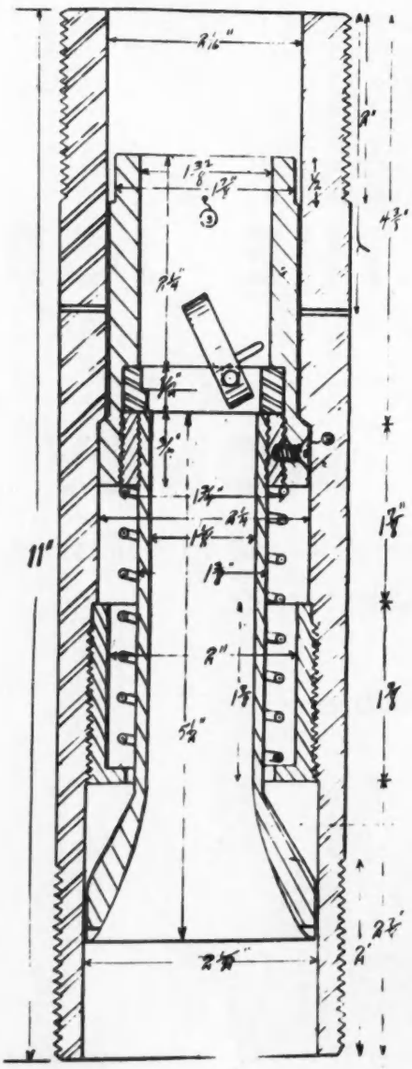
ports. Best results with this valve were obtained with spacings of approximately 300 feet between valves and when using from eight to ten valves per well. This valve gives better results in high fluid level wells.

Outside-Type Spring-Controlled Valves

Valves under this heading are of the latest developments in flow valves. At the present time only three makes of these valves are being used in this field. These are referred to as "F," "G" and "H." The most important advantages of these valves is that of having a full opening so that a swab or paraffin scraper may be passed through the tubing. Subsurface pressure readings may also be taken when using these valves. The "F" valves, Figure 7, are similar in construction to the inside-type "C" valves. The main stem has a larger seating head than the inside-type valve, and a spring with lock nuts replace the flat disc of the opposite end of the stem. The small tube surrounds the stem as on the inside-type and is identical in construction; but this tube is attached to a concave plate with the port extending through the plate. This plate with valve attachment is then bolted with capscrews to the main tubular casting. Special gaskets are placed and cemented between the main body and the valve plate to prevent leakage.

The operation of the valve is based upon pressure differential for opening and gas velocity for closing. The variables of this valve to meet well conditions are: clearance between the enlargement of the valve stem and the surrounding tube, sizes of inlet and outlet ports, stem travel, and spring tension. With such a large number of variables to work with, almost any desired opening and closing pressures can be obtained. Therefore, these valves are constructed as ordered, to meet individual well requirements. With 300 pounds available pressure and a static fluid level of approximately 2400 feet from the surface with zero pounds at the surface, the writer has had very good success with these valves set to open 100 pounds under the casing pressure and close with a differential pressure of 50 pounds, when spaced approximately 250 feet apart, from the packer upward, with the top valve at approximately 2300 feet from the surface. This is given as an example for one well setting, and will be further explained later in this paper. Many other settings have been successfully

FIGURE 5



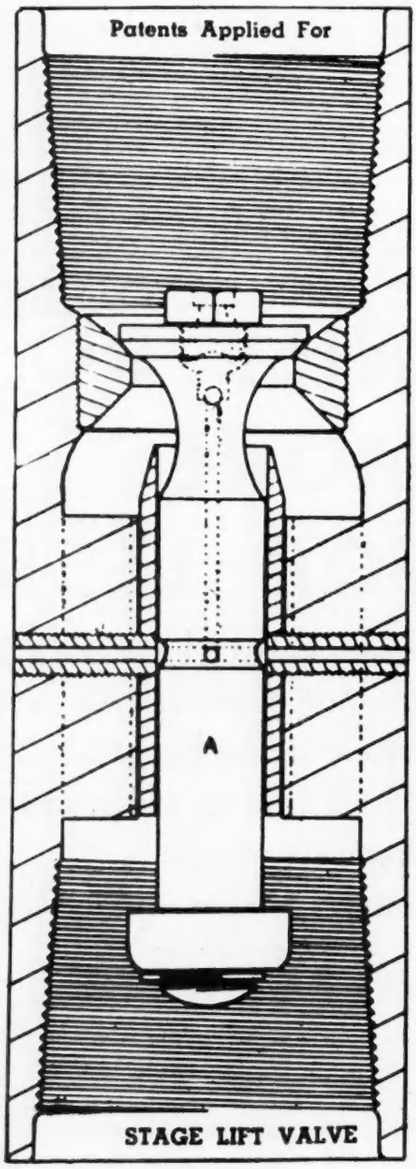
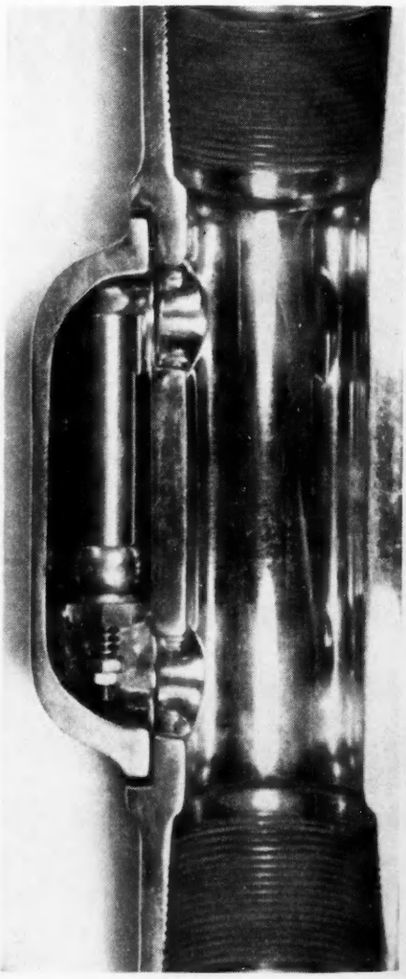
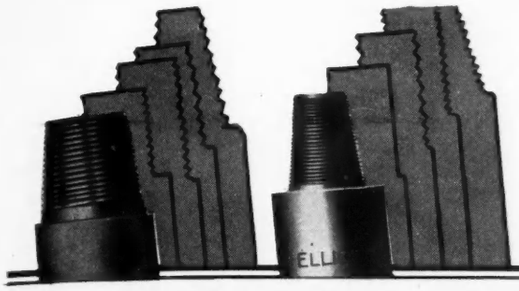


FIGURE 6 (left)

FIGURE 7 (below)





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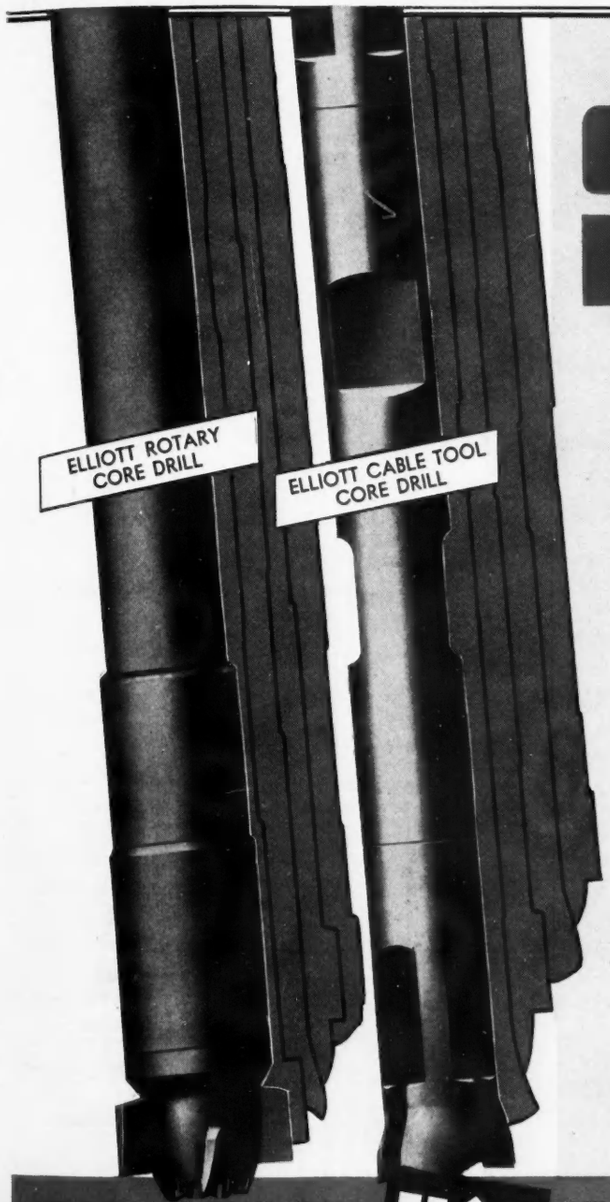

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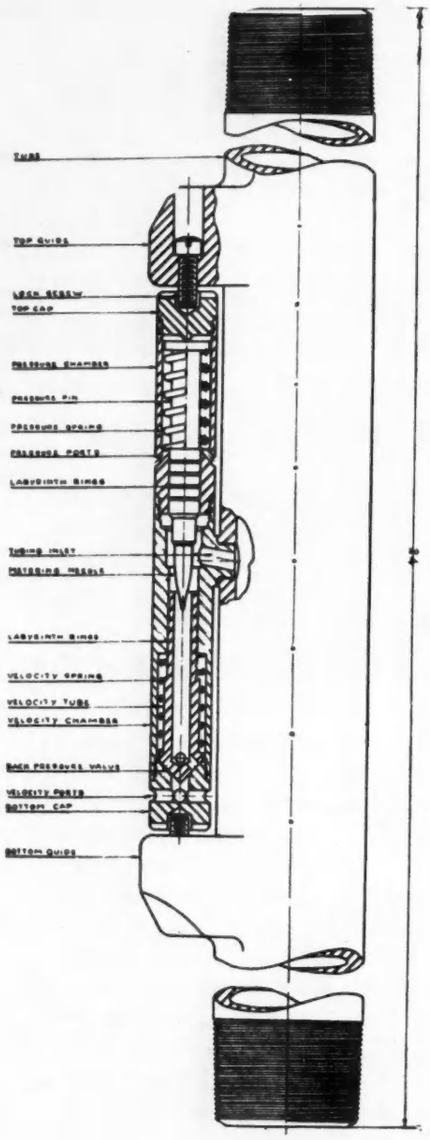
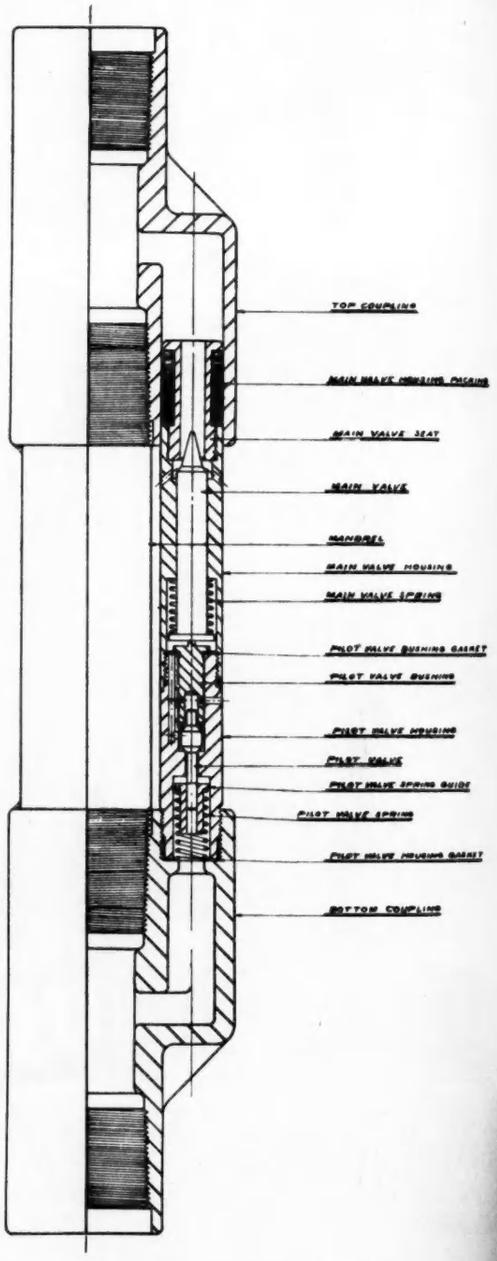


Left:
FIGURE 8

Right:
FIGURE 9



used, including the use of these valves as intermitters, as will be discussed later.

The construction of the "G" valve, Figure 8, is considerably different from the last-mentioned valve but is similar, in that it depends for its actions upon differential pressures and gas velocities. This valve has a long cylindrical tube enclosing a close-fitting velocity tube, held open with a spring and a metering pin; and also held in open position by a spring. The cylindrical tube is attached to a special tubing nipple with projections or valve supports welded on each end. Small holes at the end of the cylindrical tube enclosing the velocity tube, admit casing gas which passes through the velocity tube into the tubing nipple. Holes at the opposite end of the cylindrical tube admit gas pressure to the base of the metering pin. The action of the valve depends upon the velocity of the gas passing through the velocity tube which forces it toward a seat, thereby compressing the spring opposing it. After the velocity tube is seated, the metering pin with a tapered point moves into the hole in the velocity tube, thereby compressing its spring until the pin seats into the velocity tube. At this position, gas cannot flow through the valve. When pressure inside of the tubing nipple reaches a predetermined point, (governed by cross sectional area of the pin seat against the velocity tube and the tension of the spring on the pin) with respect to the pressure outside of the valve, the pin leaves its seat on the velocity tube, admitting gas, and completing the cycle. This valve also has a number of variables to permit different settings to meet well conditions. A few of these are: various tapers on the metering pin, different tensions of springs for both the metering pin and velocity tube, and varying lengths of velocity tube shoulders, or velocity tube travel. Very good success has been had with various settings of this valve.

The "H" valve, Figure 9, is based upon a pilot

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control valve in connection with the main valve, controlling the inlet gas. It consists of a cylindrical tube with ports in one end, and in the center, surrounding a close-fitting pin with a tapered end, its seat, and a small stem with a center enlargement on each side of which is a ground seat. The last-mentioned part of the valve, known as the pilot valve, is spring balanced, and controls the action of the main valve. The cylindrical tube enclosing the valve mechanism is attached to two lugs, welded to a nipple. Each lug has a port connecting with the valve mechanism. This valve depends for its action upon the difference in pressure between the casing and tubing for both opening and closing. Assuming that the valve is in a closed position, the action of the valve might be outlined as follows: The casing pressure, by means of center ports in the cylindrical tube, acts upon the cross sectional area of one of the pilot valve seats, thereby compressing the pilot valve spring. At the same time, the same pressure acts upon the base of the pin, compressing the spring supporting the pin, and keeping the pin tightly sealed in its seat, shutting off the upper port in the cylindrical tube. When the pressure on the inside of the tubing nipple reaches a predetermined amount, it forces the pilot valve from the lower seat into the upper seat, thus shutting the center ports of the cylindrical tube. When this is done, the pressure, which had been trapped and acting against the pin, is released into the tubing. This causes the pin to leave the seat and admits casing gas through the upper port in the cylindrical tube into the tubing nipple. As the pressure drops in the tubing nipple, the pilot valve is forced to the lower seat, forcing the casing pressure against the lower end of the pin, forcing the pin into the upper seat, and shutting off the casing gas from the tubing nipple. This completes the cycle. There are variables in this valve, which enable it to be set to meet individual well requirements. A few of these variables are: port sizes, spring tensions and seat diameters. This valve has just recently been introduced into the East Texas field.

Mechanical, or Wire-Line, Operated Valve

This valve, Figure 10, consists of a tubular casting, with an enlarged wall thickness in the center bored to support a ball. When inserted into position, this ball projects slightly into the inner side of the casting, and is kept in the socket by a port bushing screwed into place from the outer side of the casting. The valve depends for its action upon a weight suspended on a cable to strike the ball from the inside of the tubing, forcing the ball away from its seat. When a series of these valves are placed in a string of tubing in a well, the weight opens the valves successively downward until a working fluid level is reached. The balls remain away from the seats only while the weight is in the casting containing the ball.

Recent developments on this device have been toward lifting and lowering the weight by a gas-driven hoist. This device has been used in only a few wells in the East Texas field.

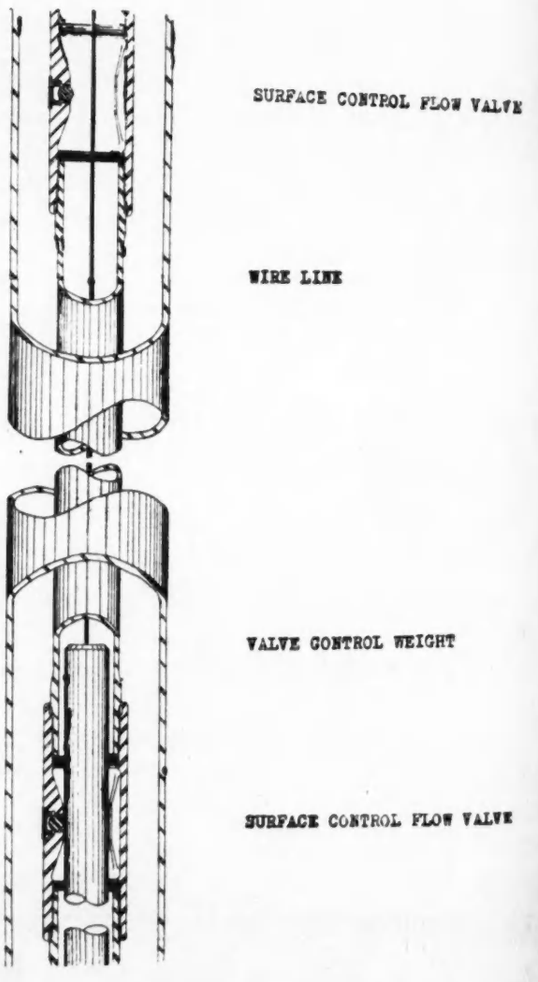
Present and Future Valve Settings

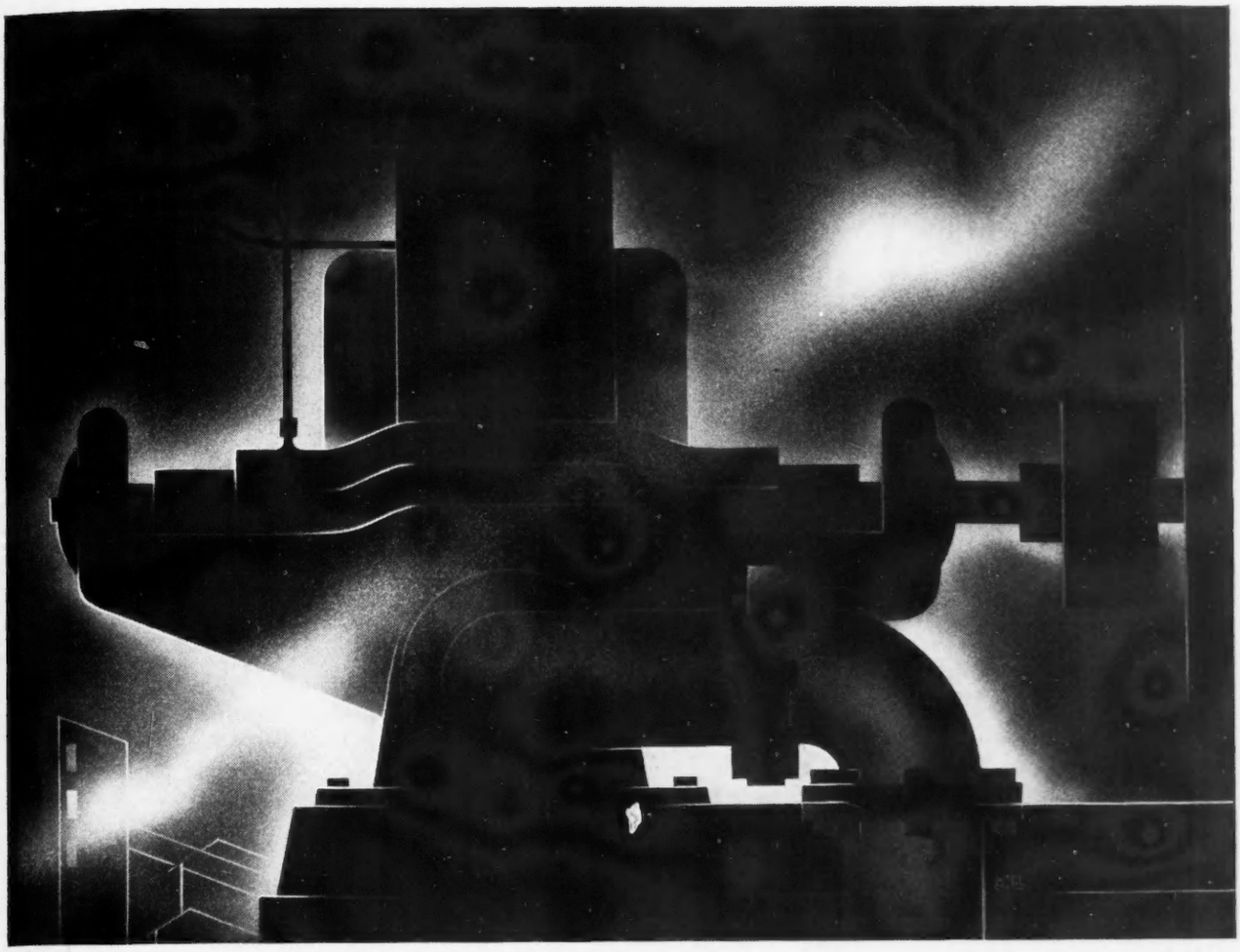
The proper installation of valves in wells, regardless of the type of valves, is more important than one would think when first entering the field of gas-lift. It has long been a hope among gas-lift engineers and manufacturers that some day valves could be taken to a well with a definite setting to follow; and such a setting would continue to work to the depletion of the well. We are not convinced that this will not become a reality some day, but at the writing of this paper it is still a hope.

Considerable progress has been made in the development of proper spacings for known well conditions, but certain conditions must be determined if satisfactory results are to be obtained.

Before attempting to equip a well with valves, it is first necessary to determine the approximate static fluid level. This can be done by using a subsurface-pressure gauge or a float. The use of a gauge is preferred because gas often hinders proper working of a float and the result is a false fluid level. When a gauge is used, the reading obtained is multiplied by three, since East Texas crude weighs approximately one-third pound per foot, and the height of the fluid standing in the hole is determined. After this has been done, valve spacing can be calculated. Best results have been obtained by spacing the top valve approximately 200 feet above the determined static fluid level. This is done to be certain that

FIGURE 10





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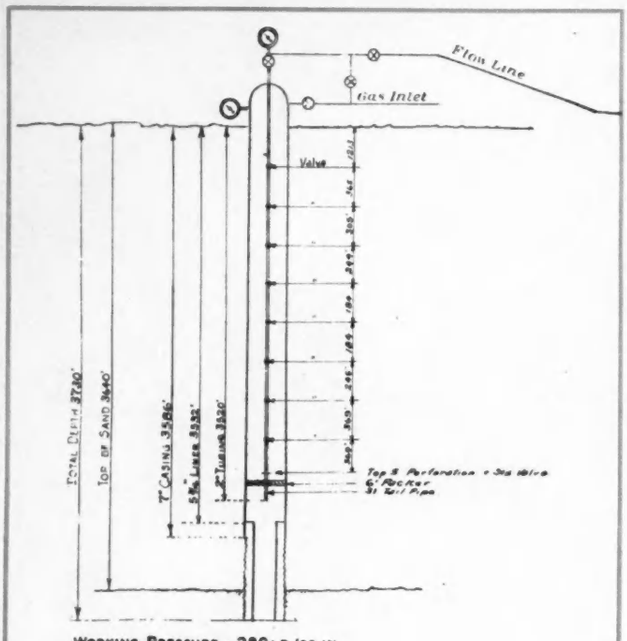


FIGURE 11

the upper valve is always above the fluid level, to take care of fluctuating levels. Calculations are then made to determine the drop in level in the annular space between the tubing and casing, and the rise in level inside of the tubing when a given or working gas pressure is applied to the casing. These figures and the calculations of the amount of fluid drop in the casing, caused by the removal of the well's daily allowable, gives the working fluid levels in the annular space. Care is taken to space from three to five valves at intervals of approximately 180 feet in the space determined to be the working fluid level. Any lower valves might be spaced at 300 feet apart, Figure 11.

In wells capable of producing only twenty barrels or less, it has been found that good results might be obtained with spacings of approximately 250 feet between valves, from the perforation above the packer upward to approximately 200 feet above the static fluid level. Such wells will always have the gas to flow around through the perforations at the end of the flow period. This pertains to wells where the casing and tubing gas is released at the end of the flow periods, see Figure 12 for detailed drawing. Gas measurements are taken at least once per month on each well.

Intermitters

Surface intermitters, where gas is admitted at intervals to gas-lift fluid, have been used for several years; but not until recently have subsurface intermitters been introduced. First installations of this type consisted of a closed setting, using a packer, with no perforations above it, and three regular outside type valves, spaced approximately 300 feet apart. All oil in the annular space between the casing and the tubing was displaced before setting the packer. It was found that interval heading action was obtained, but the intervals between the heads were erratic. Other installations were then made in a similar setting using two valves. Better results were obtained, but valve leakage between heads soon caused paraffin accumulations, and such settings were removed.

The latest developments in intermitter operations have been in connection with the usage of specially-designed chambers and only one outside-type valve which is set to open with a 100-pound fluid head, with a 300-pound maximum input line pressure, see Figures 13, 14 and 15, and close at a 200-pound differential pressure. Several wells have been equipped with such settings, and the results have been so gratifying that the writer is now planning such settings for other than "stripper wells." It is believed that each well's output, over 24-hour periods, can be regulated by the depth at which the intermitter chamber is submerged together with input pressure.

Summary

In summarizing this paper, the gas-lift wells of the East Texas field may be divided into four distinct classes.

1. High fluid level wells, capable of producing more than the prorated allowables;

2. Low fluid level wells capable of producing the marginal allowable of 20 barrels, or slightly more, per day;

3. High fluid level wells with high percentages of water; and

4. Wells capable of producing less than the marginal allowable of 20 barrels per day.

The wells in the first of these groups are very simple to handle with gas-lift. These wells need only to be agitated to start flow; and, consequently, little thought is necessary for valve spacing to obtain low ratios on input gas or high velocities. Wells of this group have bottom-hole pressures ranging from

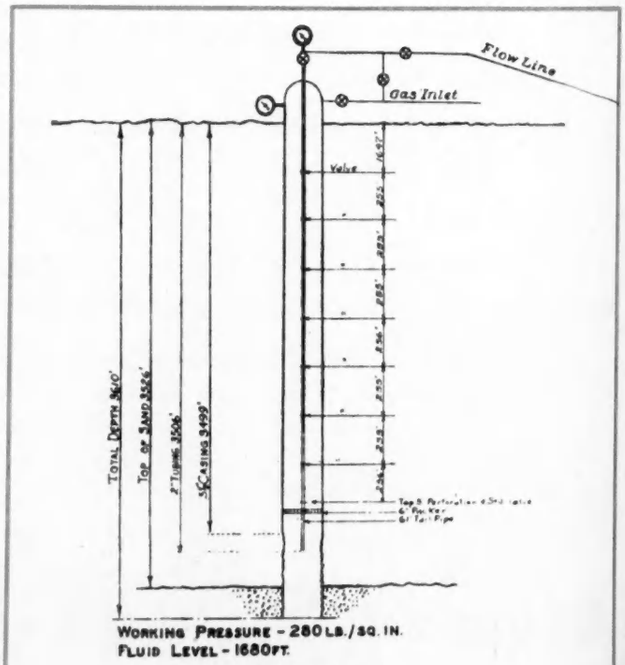
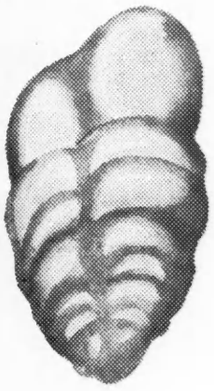


FIGURE 12

Textularia hockleyensis
Enlarged 60 diameters



$10,000 FOR A *bug*

. . . a part of the cost of operating a dependable Natural Gas Service

● The "bug" pictured here, 60 times enlarged, may some day have to do with the comfort and convenience of *your* family.

In the vernacular, "bugs" are microscopic fossils of creatures like snails and clams that lived millions of years ago. These fossils are now found deep in the earth, and are an aid in finding structures suitable for the accumulation of gas and oil.

The United Gas System employs scientists known as *paleontologists*, who study specimens brought up from underground in drilling. From his identification of "bugs" found in a given well the paleontologist knows about where the drill is in relation to a possible oil or gas reservoir.

If Natural Gas is found there, it will become a part of the reserve which the System must continually maintain.

The cost of drilling to a point where this "bug" is found amounts to at least $10,000.00, and frequently five or six times that amount. Yet it is only part of the cost of operating a *dependable* Natural Gas service.

UNITED GAS SYSTEM

NATURAL GAS • THE MATCHLESS FUEL FOR HOME AND INDUSTRY

approximately 700 to 900 pounds per square inch.

The second group comprises wells which are more difficult to handle, because gas usually flows around through the bottom perforations at the end of the producing periods. In many of these wells it is necessary to release the casing pressures at the end of producing periods to allow oil to fill into the tubing and annular space when conventional settings, as shown in Figure 11, are used. With this type of operation it is difficult to operate at ratios under 2000 cubic feet per barrel. We believe this problem will be handled satisfactorily with chamber intermitters as shown in Figure 13.

The wells of the third group are similar to the first group, in that the fluid levels are high and such levels are maintained even though high rates of flow are maintained. Such wells are being handled with many different types of valves and settings.

The fourth group of wells is the most difficult to handle, because fluid levels are low and rates of "fill in" vary considerably. Such wells have been handled to depletion with different types of valves and settings, but in all cases thus far, excessive gas

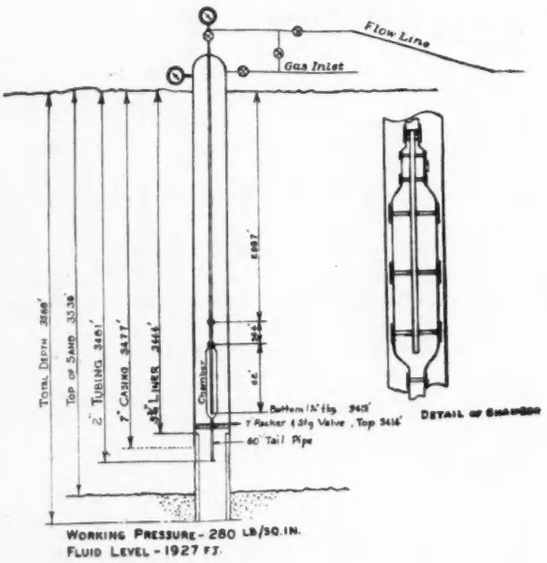


FIGURE 13

volumes have been used. The present chamber intermitter settings, Figure 14, seem to be the answer to efficient operations for these wells.

In this paper, the writer has endeavored to show the working principles of various types of valves and their application, besides trying to show the considerable possibility that gas-lift may successfully produce the wells of the East Texas field to depletion. It is believed that the developments and future possibilities in gas-lift are such as to warrant consideration from all operators to the extent that the further development of the methods and equipment should be greatly accelerated.

Acknowledgements

In the preparation of this paper the writer has used his own descriptions of valves and settings.

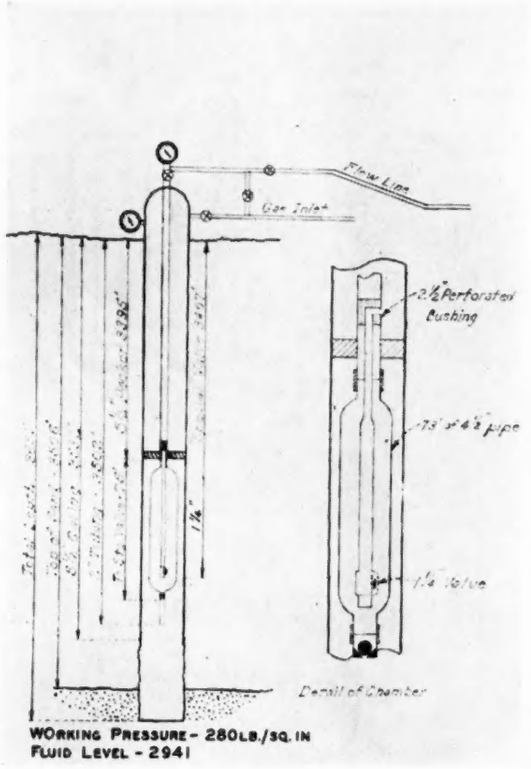


FIGURE 14

These may not in all cases agree with the manufacturer. Many valves, not mentioned in the report, have been used in the East Texas field, but the writer has tried to limit this discussion to valves with which he is familiar.

The author is indebted to Ralph A. Watson for preparing the figures used in the paper, and to Humble Oil & Refining Company for permission to publish the paper.

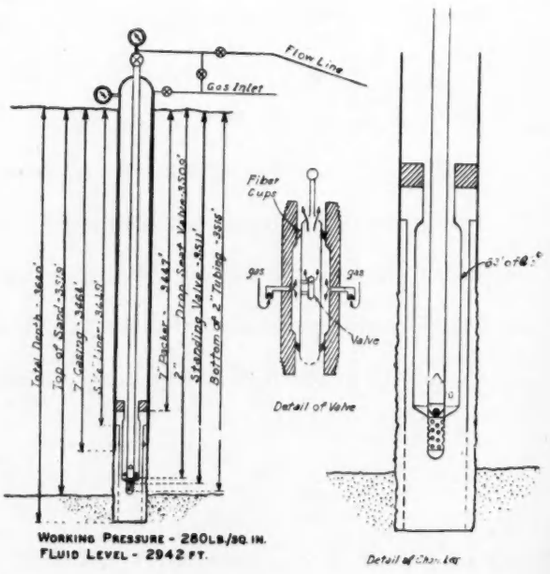


FIGURE 15

JOHN D. ROCKEFELLER, AGED KING OF OIL AND FOUNDER OF STANDARD OIL COMPANIES, DIES SUDDENLY

SPENT HALF OF HIS NEARLY 98 YEARS MAKING MONEY AND THE REST IN GIVING

"OLD JOHN D. has gone."

There probably was not an oil company in the world May 24 in which someone did not utter just those words, unless the wires were down because of storms or other reasons. John D. died at 4.05 a. m. May 23 at his winter home at Ormond Beach, Florida.

Old John D. was John Davison Rockefeller. He was to the oil industry and finance what Richard Wagner was to grand opera, what Napoleon was to military strategy, what Nelson was to naval tactics, what Edison was to electricity. He was a master of his game.

There was a time when he controlled most of the production in this country, which produces more than half of the world's supply. In the old days it produced proportionately more.

One of Rockefeller's sayings was: "I believe it is every man's religious duty to get all he can honestly, and to give all he can."

He certainly missed very few bets on accumulating money during his active years of business. He was a shrewd, hard trader, buying out competition where he could, crushing it by stiffer competition where he could not buy. This policy was applied to competitive personnel as well as to corporations. If a man put up a good stiff fight against the "giant octopus," as Rockefeller was commonly called in the old days, Rockefeller often wound up matters by enlisting the services of the worthy opponent to occupy a dignified position in one of his own companies. In addition, he would mollify stockholders of the combatant's company by an offer which common sense would not allow them to refuse.

As to the "give all he can" part of Rockefeller's saying, the press has been telling for years of his philanthropical activities, estimating his gifts to various foundations and charities at half a billion dollars. Much of this giving was arranged so the donor's name was kept quiet. John D.'s public giving, which he let the world know about, was publicized on many occasions by photographs of him presenting dimes to youngsters.

In his later years—he would have been 98 on July 8—John D. took pride in what he called scientific giving. He believed gifts improperly placed did not have the capacity for ultimate good of those carefully placed. But that did not seem to cut down the volume of his disbursements.

Even though John Davison Rockefeller died just a little over two years shy of the century mark, which he confidently expected to attain, counsel of the oil industry Croesus carried the weight of that of a sage up to a short time before his death. It was told in 1936 that his counsel was sought on matters of grave import even then by helmsmen of the Standard Oil Company of New Jersey, although the old ringmaster had not handled the whip personally for 30 years or more.

—International News Photo

JOHN D. ROCKEFELLER, SR.

He was the most widely known man ever associated with oil. During the span of his life the industry was born and grew to one of the greatest on earth. John D. has had his critics, but the fact remains that it was largely due to the efforts of this one man, while the industry was in its infancy, that the industry has been enabled to meet the demands made of it.

The late tycoon of oil began life on a New York farm, moving to Cleveland at the age of 14 in 1953. He stayed there long enough to make Cleveland the oil capitol of the world in the nineteenth century.

Early in life he had inculcated into him the dignity of labor, the value of money, and the essentiality of Christianity. In connection with the latter, he joined the Euclid Baptist church in Cleveland at the age of 15 and was an active worker in the Sunday school and congregation as long as he lived there, serving as teacher and superintendent of the Sunday school. Before he was 19, John D. was a trustee of the church.

Soon after this, with a thousand dollars of his own and another thousand borrowed from his father, he entered partnership with Maurice B. Clark in the commission business, a business with which he was familiar as he had worked for Hewitt & Tuttle, a commission house in Cleveland, for salaries ranging from $4 per week to $700 per year after leaving school at the age of 16.

One year after Colonel Drake's discovery in Pennsylvania, when John D. was 21, he purchased an interest in a refinery, marking his entry into the oil business. In 1865 Rockefeller sold his interest in the commission business and bought out some associates in the refinery project, and the new firm of Rockefeller & Andrews rapidly enlarged oil manufacturing facilities.

Even this early in life, the man who has alternately been referred to as the greatest octopus of corporate business and the greatest philanthropist alive, exhibited an uncanny foresight. He saw in the new industry a chance of a lifetime—saw, also, that future growth of the business was to consist mainly of export business. William Rockefeller & Company was formed, with brother William going to New York to handle the export business. Henry Flagler was at this time taken into the firm in Cleveland.

Further expansion in business demanded by 1870 formation of the Standard Oil Company of Ohio, with John D. holding the whip hand as president.

When he was 31 and kerosene was the most important product of petroleum, Rockefeller became the first president of the National Refiners Association. His obsession, if it may be called that, at this time was to give the world artificial light that would give maximum service at the least possible cost. So far as kerosene was concerned and as long as it lasted for that purpose, he came pretty close to being "the light of the world."

Two years after organization of the Ohio Standard, its capital stock was increased to $2,500,000. In 1872 that was an unheard of amount, and even more out of line with the times was an annual business of 25 million reported by the company.

Ten years later, or in 1882, business had grown so that the Standard Oil Trust, capitalized for 70 million and later increased to 95 million, was incorporated to handle the business more efficiently. Rockefeller kept his post at the helm. When courts broke the trust, he was, financially, beyond the point of worry.

But to go back a bit, in 1864, he married Laura C. Spellman, a high school classmate whose tastes in social work and philanthropy paralleled those of the oil king. Five children were born and reared in simplicity and with frequent reminding of the importance of the church in life. This latter strain in the Rockefeller make-up, regardless of what may have been thought of some of his business tactics during the climb to the peak, may explain why he has spent the last 30 years of his life largely in supervision of organized charity work involving only money made by him. His gifts are too numerous to mention, even the relatively small percentage of them the public knows about, but the Rockefeller Institute for Medical Research in New York and Chicago University come close to the top of the list. In 1935 his philanthropic disposals were estimated at half a billion dollars. He has given to institutions throughout the world, regardless of race or creed.

J. E. HOWELL JOINS LION OIL & REFINING; SUCCEEDED AT EMPIRE OIL & REFINING BY C. S. WARREN

HOWELL TO BE VICE PRESIDENT OF PRODUCTION; WARREN GENERAL SUPERINTENDENT

J. E. HOWELL

J. E. HOWELL, who has been general superintendent of oil production for Empire Oil & Refining Company, has resigned effective June 15, to become vice president in charge of production for Lion Oil & Refining Company of El Dorado, Ark. C. S. Warren, who has been superintendent of the Kansas division of Empire Oil & Refining Company, has been appointed general superintendent of production, succeeding Howell, by M. R. Shaffer, manager of the company's oil division.

Following his graduation from Alabama Tech at Auburn in 1919, where he received the degree of Bachelor of Science in Electrical Engineering, Howell joined The Empire Companies as a junior engineer and was assigned work in the Kansas fields. In July, 1922, he was transferred to Okemah as district superintendent, and was promoted to division superintendent of the North Texas division with headquarters at Wichita Falls in April, 1923, where he remained until he came to Bartlesville, Oklahoma, as assistant general superintendent on September 1, 1925. Following the promotion of M. R. Shaffer to manager of the division in 1934, Howell was made general superintendent.

Warren, since entering Empire service as a junior engineer in 1919, has been constantly with the oil division. He was in the Duncan and Healdton field of Oklahoma in 1921, and went to Okemah the following year. In 1925, he came to the company's operating headquarters at Bartlesville, where he remained until the following year, at which time he was sent to Pampa and Amarillo districts of the Texas Panhandle. He was assigned to the New Mexico fields in 1928, and was transferred, as superintendent of the Kansas division, to El Dorado, in 1930. Warren graduated from Alabama in 1915 with the degree of A.B. In 1919, he received a B.S. degree from Alabama Tech.

E. J. HENRY, vice president of Atlantic Refining Company, Philadelphia, was in Houston last week. Henry is making an inspection tour of the coastal area, and recently inspected the company's new refinery near Port Arthur, Texas.

I. W. MURFIN, Wichita oil producer, suffered a scalp injury May 16 when a lever on the calf wheel knocked him down while he was visiting a wildcat test he is drilling near Furley, Kansas.

JOHN L. McKINNEY, 94, one of Pennsylvania's pioneer oil producers, died May 20 at his home in Titusville following a month's illness. He was one of the outstanding figures in early Pennsylvania oil development history, starting his career at the age of 17 following drilling of the Drake well. His operations centered, for the most part, along Oil Creek, near Titusville and in McKean County, and many were carried on in partnership with his brother, the late J. C. McKinney.

The brothers at one time held extensive properties in the Pennsylvania oil region, selling out to Standard Oil Company. Later, John became president of South Penn Oil Company, a Standard subsidiary. He was also one of the founders of the Titusville Oil Exchange, first clearing house for stabilization of the oil industry, and served as its president for several years. McKinney was also a founder and director of the American Radiator Company.

ROY MARCH, field engineer for Shell Oil Company in California, and E. W. Masters, formerly division superintendent in the Bakersfield area, have departed for The Hague, where they will spend a few months in the production department of Royal Dutch Shell. Ernest Merrill, petroleum engineer at Long Beach, will first tour Texas fields and then proceed to The Hague for a few weeks.

C. L. MOODY, chief geologist in the Shreveport district for Ohio Oil Company, and recently elected vice president of the American Association of Petroleum Geologists, was honor guest at a barbecue given May 22 at Shreveport by the Shreveport Geological Society.

HERBERT G. OFFICER, 48, supervisor of the land department for the Amerada Petroleum Corporation at Tulsa, died at Monterey, California, May 18, following a brief illness. A resident of Tulsa for more than 18 years, he was a native of South Carolina, and was active in mining engineering and petroleum geology for several years. After spending some time with Prairie Oil & Gas Company, he joined the staff of Amerada Petroleum Corporation in 1926. He was investigating properties for the company in California when his death occurred. The body was returned to Tulsa.

W. G. SKELLY, president of Skelly Oil Company and Pacific Western Oil Company, May 14 was elected president of Mission Oil Company.

J. E. BAILEY RESIGNS FROM TEXAS RAILROAD COMMISSION TO JOIN TIDE WATER ASSOCIATED OIL COMPANY

WILL SUPERVISE ENGINEERING WORK IN THE EAST TEXAS FIELD FOR THE CONCERN

J. E. BAILEY

J. E. BAILEY has resigned as Chief Petroleum Engineer of the Texas Railroad Commission effective June 1. Bailey will join the Tide Water Associated Oil Company and will be located at Kilgore where he will supervise petroleum engineering production work for oil fields in that section of the State.

Bailey was educated at Tulane and Rice Institute, and began his petroleum engineering work in Oklahoma in January, 1919. At that time he was employed by Ohio Cities Gas Company, predecessor of The Pure Oil Company. He continued his work in Oklahoma, Kansas, Arkansas, and West Virginia up to 1924.

Included in his work was the design and construction in refineries and gasoline plants as well as pipe lines. He became familiar with conditions in Heald-

ton, Cushing, and other Oklahoma fields, as well as Cabin Creek in West Virginia, and Smackover and El Dorado in Arkansas. In 1924 he was transferred to Texas where he acted as chief engineer for The Pure Oil Company, specializing in engineering problems in the Van and Lost Lake fields in Texas and the Sweet Lake field in Louisiana.

Bailey joined the Railroad Commission staff in 1934 as chief petroleum engineer in East Texas. In 1935 he was advanced to the post of chief petroleum engineer which he has held since that time.

A. S. BROGDON, 38, salesman for the South Chester Tube Company, with headquarters at Fort Worth, died May 17 in a hospital at Livingston, Texas, from injuries sustained in an automobile accident on May 15. He is survived by wife; a brother, Earl Brogdon, and a sister, Mrs. J. P. Steele, all of Fort Worth.

L. P. TEAS, Houston, has been appointed chief geologist for Humble Oil & Refining Company. He succeeds L. T. Barrows.

S. F. SHAW has returned from San Antonio to Oklahoma City, where the Westgate-Natural Gas companies, for which he is consulting engineer, are making plans for enlarging their 5300-horsepower gas-lift plant.

WILLIAM F. PRATT, for 12 years assistant to C. M. Crebbs, general agent, Mene Grande Oil Company, formerly Venezuela Gulf Oil Company, at Maracaibo, Venezuela, has resigned and returned to the United States. He plans on spending the summer in Colorado. Prior to going to Venezuela in 1925, Pratt was connected with Mexican Gulf Oil Company at Tampico, Mexico, for four years.

BYRON MEREDITH OF SINCLAIR PRAIRIE OIL COMPANY ELECTED CHAIRMAN OF A.P.I. EAST TEXAS CHAPTER

VICE CHAIRMEN ARE L. H. MOORE, M. W. McVEY AND R. B. BRADBURY

THE East Texas Chapter of the American Petroleum Institute, Division of Production, elected officers for the ensuing year at its regular monthly meeting at Kilgore on May 25. Byron Meredith, division superintendent of East Texas and Gulf Coast for Sinclair Prairie Oil Company, was elected chairman.

Three vice presidents were elected, as follows: R. B. Bradbury, Houston Oil Company of Texas; M. W. McVey, independent operator; and L. H. Moore of Gulf Oil Corporation.

W. S. "Buck" Morris, field chairman for the East Texas Engineering Association, was elected secretary-treasurer. G. P. Brainard, Jr., Shell Petroleum Corporation, was made assistant secretary-treasurer.

An advisory committee, with R. D. Risser, Shell Petroleum Corporation, as chairman, was elected, as follows: L. C. Peters, Humble Oil & Refining Company; D. B. Kiniry, Sun Oil Company; C. D. Hubbard, Weaver-Crim Corporation; R. O. Garrett, Arkansas Fuel Oil Company; George Kent, Hanlon-Buchanan; J. E. Springer, Tide Water Associated Oil Company; L. A. Detrich, Bay Oil Corporation; E. N. Stanley, Texas Railroad Commission; L. G. Littlejohn, Snowden & McSweeney.

The following program committee was elected: W. E. Schoeneck, The Ohio Oil Company; F. J. Mikeska, Gulf Oil Corporation; Frank Thing, Ohio Well Supply Company; and L. H. Mack, General American Oil Company.

The chapter's membership committee will be as follows: Jack Straight, Empire Oil & Refining Company; J. J. Jenkins, drilling contractor; and J. Randolph, National Supply Company.

JOHN V. BOYCE, Houston, chief scout for Humble Oil & Refining Company, appointed chief scout. D. P. OlcottcC has resigned and J. I. Riddle, Jr., has been appointed chief scout. D. P. Olcott will have charge of statistical and evaluation work formerly handled by Boyce.

R. B. LAWRENCE, 64, pioneer oil man of Chambers County, Texas Gulf Coast, died at Kerrville, May 24, after a long illness. He was one of the developers of the Goose Creek oil field, and also was interested at Burkburnett.

VIRGIL RICHARDSON, for the past two years in the exploration department of Carter Oil Company at Wichita, Kansas, has been transferred to the scouting department of the company at Tulsa.

J. M. CAMPBELL ha sbeen elected president of Reiter-Foster Oil Corporation, succeeding James G. Lyons, resigned. Campbell was formerly vice president of Alpha Petroleum Company and president of Malta Oil Company.

BYRON MEREDITH
Chairman

R. M. BRADBURY
Vice-Chairman

W. S. MORRIS
Secretary-Treasurer

R. D. RISSER
Advisory Chairman

M. W. McVEY
Vice-Chairman

Edited by
WM. V. GROSS, Associate Editor

France's Search

INDICATIONS OF OIL FOUND IN NUMBER OF LOCALITIES

By P. CHARRIN
Societe de Prospection Electrique Procedes Schlumberger

FRANCE is not an important oil producing country, since its production is only around 75,000 tons yearly. However, there has been a certain amount of exploration and prospecting in this country since the end of the nineteenth century.

It is easy to summarize this activity, thanks to a very comprehensive study on the subject presented at the Seventh International Mining and Metallurgical Congress in October, 1935, by P. Trouilloud, chief engineer of the only producing oil company in France, the Societe de Pechelbronn.

Several Indications

A number of districts in the French territory have definite indications of oil formations. First of all there is Alsace, with the oil field of Pechelbronn. Further there are some indications in the Jura, Alps, Limagne, Languedoc, and finally in the southern part of France, especially the Landes district, and the western part of the Pyrenees Mountains.

We shall now give a summary of the exploration conducted in these different districts up to 1935.

1. ALSACE

The oil field of Pechelbronn has been known since the fifteenth century, and its exploitation began in 1735. From 1813 to 1876, about 100 shallow holes, 50 meters or so deep, were drilled. The exploitation grew in importance with the beginning of the twentieth century, the drill holes becoming deeper and deeper, but not exceeding a depth of 500 meters. During the war, in 1916, exploitation by shafts and galleries was inagurated, and is still continued at the present time, thus constituting one of the very few existing cases of oil mining. However, the production by wells is slightly larger than the mine production.

The accompanying table gives the production figures of Pechelbronn field, as well as the extent of the drilling carried out there.

It is to be noted that in this one French producing district, the production is under one ton for each meter drilled. The oil sands are in Oligocene formations, and generally more or less lenticular.

Showings Near Hirtzbach

There are also some oil indications in the southern part of Alsace, near Hirtzbach. Around the year 1890 a few shallow holes were drilled, and most of them encountered sandstones with oil showings, and even a short flow of gas mixed with water and oil. In 1897 was drilled a hole 539 meters deep, which reached a bituminous limestone. From 1928 to 1930 two holes were drilled. The first was 217 meters deep, the second, 180 meters. They brought to light two oil sands, giving a few hundred gallons of crude. At the present time new attempts are being made in the same district.

A few holes have been drilled in Alsace outside of the above mentioned districts of Pechelbronn and Hirtzbach. In all—from 1918 to 1933—16 holes were drilled, with a total depth of 9,030 meters, which means an average depth of only 575 meters. As a matter of fact, most of the drill holes were even less deep, since in the average is included one drilled to a depth of 1200 meters. This latter was drilled in the Alsatian Potash Basin as a prospect hole for potash.

2. JURA MOUNTAINS

Many salt beds of Triassic age are found in the Jura region, and these are mined for salt production. In 1906 a company so engaged drilled a hole 220 meters near Vaux-en-Bugey to prospect for salt. This drill hole encountered an oil sand at 190 meters, and a very important gas flow which caught fire and destroyed the derrick. The work was abandoned, but the gas flow continued for some time. At first the gas production was estimated to attain 1000 cubic meters per day, with a pressure of 60 atmospheres.

Another and deeper hole was drilled in the Jura in 1917 for coal research. This hole, which reached 1651 meters, found oil showings at 477 meters.

Gas at Vaux-en-Bugey

Following the discovery of gas in 1906, a few holes were drilled between 1918 and 1932, most of them near Vaux-en-Bugey. Among them, the hole Vaux 2 met a very important gas flow at 220 meters, with a production of more than 100,000 cubic meters per day, and a pressure of 15 kgs. Among the five other holes drilled near Vaux, only one, Vaux 5, yielded gas production, 600 meters per day. At present, the only one

Pechelbronn Production

YEAR	Oil Production in Wells (Tons)	Oil Production in Mine (Tons)	Total Production (Tons)	Number of Metres Drilled
1919	30,300	16,955	47,255	37,497
1920	42,025	12,844	54,909	38,579
1921	43,824	11,749	55,574	51,114
1922	45,150	24,959	70,109	46,343
1923	33,225	37,468	70,694	29,605
1924	32,356	38,512	70,869	29,726
1925	37,154	26,495	63,650	31,108
1926	38,552	23,793	62,346	43,718
1927	39,164	29,477	68,642	46,298
1928	37,738	33,986	71,724	51,094
1929	38,540	33,121	71,662	54,115
1930	41,506	32,300	73,806	46,068
1931	42,574	30,692	73,266	45,198
1932	43,642	30,479	74,121	45,634
1933	45,048	33,780	78,828	41,482
1934	44,470	33,607	78,178	48,452
1935	42,354	33,062	75,416	41,534
1936	40,377	29,132	70,109	32,881

in exploitation is No. 2, which yields a gas production sufficient for the use of the small town of Amberieu, about 250,00 cubic meters yearly.

Altogether, the total number of holes drilled in the Jura province is 15, totalling 6361 meters, but it is to be noted that one of the above-mentioned holes reached a depth of 1650 meters, which proves that all the others were very shallow.

3. LANGUEDOC: GABIAN

At Gabian, oil seepages have been known since the year 1605, and several galleries were made in order to extract a few hundred barrels of oil.

In 1924 the French government started a drilling campaign which began by an important success. The first hole gave, at a depth of 100 meters, a flow of about 20 tons per day. After this initial success, 56 holes were drilled by the government, but only 14 proved productive, with between eight tons and half a ton per day initial production. The most productive well was Gabian 6, which gave a total production of 5763 tons in five years. In 1935 drilling was completely abandoned in this district, and the production is reduced to about 250 tons per year. The accompanying figures give the yearly production of Gabian.

Gabian Production

Year	Tons
1924	264
1925	2198
1926	5176
1927	4422
1928	2541
1929	2866
1930	2107
1931	1178
1932	609
1933	416
1934	276
1935	260[1]
1936	250[1]

The wells drilled by the French government did not exceed a depth of 350 meters, the average depth being 222 meters, and the oil producing horizon was encountered at a depth between 106 and 203 meters. The oil formation is Triassic. Even now the structure is not definitely known.

Outside of the 57 holes drilled by the French government in Gabian, 13 holes were drilled by different concerns, with a total depth of 3886 meters, but without any commercial production.

4. LIMAGNE

In the Plateau Central, the area which most attracted the attention of prospectors was the Limagne Plain. From 1880 to 1895 there were 10 holes drilled by different companies or individuals, most of them giving some indications of gas or oil. Only one (Macholles 2) drilled in 1892, was a deep hole (1164 meters). At a depth of 1000 meters it had a production of 20 barrels of oil with salt water.

Government Active

Encouraged by the results obtained before 1900, a more active campaign was started in 1918, the greater part of which was carried out by the French government. Eight holes were drilled at shallow depths, with a total meterage not exceeding 1159 meters. Some of these holes, however, gave oil and tar showings. Five deeper holes were drilled, four of these also by the French government, to depths of 550 meters, 856 meters, 1154 meters, and 1322 meters. All of them encountered sands impregnated with very heavy oil and tar. The most interesting was the deepest one (Mirabel), which had a production of only three tons from different levels.

On the whole, the exploration in Limagne was rather disappointing, on account of early indications which failed to materialize in the hoped-for production. Contrary to most of the other explorations in France, that of Limagne may be considered as having attained a sufficient depth, since all the Tertiary formations were cut by the deep holes of Mirabel and Beaulieu (1154 meters), and the basement of granitic formations reached.

5. LANDES AND PYRENEES

Numerous seepages were known in the Landes and Pyrenees in the nineteenth century. The first hole was drilled in 1890, to about 30 meters, encountering even at this shallow depth numerous oil showings. At the end of the century several holes were drilled near Gaujacq, at depths from 120 to 465 meters, with several oil showings, but without any production. After the war, active wildcatting was begun in this district, many of the holes giving oil and gas showings, but without any commercial results. This district may be considered as the most disappointing as far as oil production is concerned, since, in spite of numerous attempts, no oil or gas has been produced. However, this exploration has had the unexpected result of discovering potash beds, the study of which is continued at the present time.

Excluding the very shallow holes under 100 meters, the total number of holes drilled in the southwestern district is 36, with a total depth of 12,174 meters. Once more, the shallow average depth of these holes is to be noted, not more than 335 meters, with only five holes exceeding 600 meters (Peyrehorade 600 meters, Casteres 754 meters, Audignon 859 meters, Ste. Suzanne 952 meters, Salies 620 meters).

Alps and Miscellaneous Districts

In the French Alps there are some oil indications, especially near Grenoble and in Provence. A few explorations were conducted in the district (eight drill holes with a total meterage of 2189 meters), the most important being in Provence, and especially two holes at Gourguissel (Var), which are supposed

Showing principal areas in France which have been subjected to exploratory drilling.

[1]Estimates added by the editor.

	PRIOR TO 1918		1918–1935		TOTAL	
	Number of Holes	Total Metres	Number of Holes	Total Metres	Holes	Metres
Alsace	..	.....	18	9,427	18	9,427
Jura	2	1,873	13	4,488	15	6,361
Gabian	2	616	70	16,665	72	17,281
Limagne	10	2,628	13	5,474	23	8,102
Landes, Pyrenees	5	1,257	31	10,802	36	12,039
Alps	1	198	7	1,991	8	2,189
Miscellaneous	..	.....	17	6,897	17	6,897
Total	20	6,552	169	55,744	189	62,296

to have met some very slight oil showings.

Among the different holes which have been drilled outside of the abovementioned districts, very few are worth mentioning. However, in 1924 the French government made a test at Gournay, in Normandy, on a well-known anticline. This test was more of a geological test, as its purpose was to obtain a cross section of all the formations down to the Carboniferous. No oil indication was obtained down to a depth of 1172 meters. Among the very few other holes drilled, only four were sufficiently deep to offer any interest.

Some Based on Wigglestick

We may add that among the holes scattered over miscellaneous areas of the French territory, some were drilled on wigglestick indications, and their failures are of no significance.

The total number of the holes drilled in miscellaneous districts, and of over 100 meters deep, is 17, with a meterage of 6897 meters.

The accompanying table summarizes all the exploration made in France up to 1935, with the exception of the holes drilled in the Pechelbronn district.

This summary calls for a few comments. It would be incorrect to say that no serious endeavor has ever been made in France in the search for oil, but the total meterage drilled from 1918 to 1935 is by far too small to allow any definite conclusion concerning the possibilities of production on the French territory outside Pechelbronn. Furthermore, the small average depth of the holes cannot be compared with the average depth of production and exploration in most of the oil producing countries. This depth for 169 holes drilled since 1918 is only 330 meters, and the number of holes over 600 meters is very small, except in Alsace, as indicated below.

Therefore, the total meterage of 169—25 = 144 holes is only 55,744 — 20,914 = 34,830, which means an average of 240 meters.

If we consider that the average depth of drilling in the United States during the last five years has been 900 meters, we must conclude that exploration in France has been too shallow. We have stated that there is only one district where all the formations offering any chance have been fully explored, that is the Limagne Plain, but only two holes reached the Cristalline basement.

	Holes Over 600 Metres	Total Metreage
Alsace	9	7,260
Jura	2	1,202
Gabian	1	611
Limagne	3	3,332
Landes, Pyrenees	5	3,785
Alps	..	.....
Miscellaneous	5	4,724
Total	25	20,914

It is interesting to consider if the slight results so far obtained may be considered as discouraging or not. P. Trouilloud has presented some very interesting remarks in this connection.

For Gabian the production for each meter drilled was 1.3 tons.

For Vaux (Jura) the production was 0.8 tons per meter, if we admit the equivalence of one cubic meter of gas and one kilogram of oil.

We have already noted that in the Pechelbronn oil field the production for each meter drilled is slightly under one ton (0.9 ton).

Of Economic Interest to France

All these recoveries are considerably lower than those of the rich oil countries, such as Venezuela (40 tons per meter) or the United States (6 tons). However, the oil field of Pechelbronn, giving only 0.9 tons per meter, is considered beyond all question as interesting for French economics. Therefore it must be considered that results such as those obtained at Vaux or Gabian are rather encouraging from the French point of view.

If we consider all the holes drilled in the French territory outside of Pechelbronn since 1918, the production has been 27.000 tons (Vaux and Gabian) for 55,700 meters, that is to say a production of about 0.5 tons per meter. This yield is not bad compared to Pechelbronn or Italy (also 0.5 tons).

If we may draw a conclusion, we may say that, even if there is no indication so far in France of any rich oil producing district the possibility of discovering fields with a small production, such as Pechelbronn, does not seem excluded, and we have seen that such fields are of economic interest in France.

Considering Exploration Programs

It is therefore not surprising that oil exploration has been continued recently, and that important exploration programs are under discussion at the present time.

In the last two years the progress of exploration has been rather slow. Three districts have been the object of a few attempts, Alsace, Southern Jura and Languedoc. We shall not discuss a test drilled to about 1000 meters in Northern Jura (Ste. Colombe) placed without any serious scientific grounds, and of which the failure is of no significance. The other tests may be commented upon as follows:

1. Alsace. "Since 1935 in the area of Hirzbach (Southern Alsace) Pechelbronn Company has conducted an important wildcat campaign. The deepest hole attained a depth of 747 meters, the interest having been mostly devoted heretofore to testing the upper geological strata. In 1935 four holes were drilled with a total depth of 1279 meters. In 1936 eight holes totalized a depth of 3289 meters. Geologists of the company feel that the prospected area may be of interest. Numerous formations at different depths have shown traces of oil and tar."

2. Jura. The Southern part of the Jura, not far from Switzerland and Geneva, is covered with a Miocene formation called "Molasse." In this formation many oil indications are known (tar sands, and bituminous limestones). A test made in 1918 at Challex (273 meters) encountered three sands containing heavy oil. On the Swiss side of the border a few holes also encountered oil shows and gas flows.

To test these indications further, the French government started a test at the end of 1935 near Frangy, in the middle of the plain covered by the very slightly folded "Molassic formation." The hole reached 259 meters, encountering two tar sands at 223 and 239 meters and bituminous limestones at 246 and 254 meters. It was not possible to obtain any production. It is to be feared that the oil indications are limited to small lenses. However, a second test will be made.

3. Languedoc. We have mentioned the small production obtained at very shallow depths from the Triassic beds at Gabian. As this formation outcrops near Gabian and dips to the south, the French government has decided to test the first structure known in the South of Gabian. A deep hole has been started at Pezenas (where an outcropping anticline is known), with a projected depth of about 1200 meters, to cut the underlying Triassic beds. The hole is still in Cretaceous formation at 500 meters.

Finally, there is under discussion at present a very important and comprehensive program of exploration of the French territory. This program would be financed by the French government, a credit of 30 million francs (approximately $1.500,000 U. S.), having been mentioned in this connection.

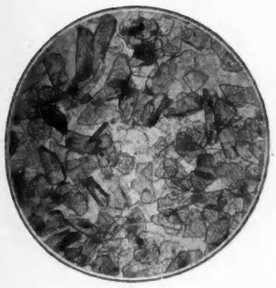
The prospecting would be conducted by all available means (geology, geophysics and drilling) with the purpose of ascertaining systematically the possibilities of France as far as oil is concerned.

It is to be hoped that no financial difficulty will hinder the execution of this important plan.

ADD TO RESERVES

Five important tracts, covering several thousand hectares, have been incorporated into the Mexican federal oil reserves by the ministry of national economy because of cancellation of concession, relinquishing of rights, and for other reasons. Among the incorporated tracts are those of John R. Morris, comprising 40 acres in the famous Amatlan fields, Vera Cruz state. Morris relinquished rights to the tract.

Two tracts, comprising some 3000 acres, held by Mexican interests near the American border, were also incorporated.



Reproduction of the micrograph at the left shows the interlocking of the flakes of the internal reinforcement used by Barrett. By laminating with the waterproofing agent, they give Barrett Pipe Line Enamels unusual toughness and resistance to soil stresses.

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The unique flake-type filler used in Barrett Pipe Line Enamels permits the use of *smaller* quantities of filler with *larger* quantities of coal-tar pitch waterproofing base. The resultant lower specific gravity of Barrett Enamels means that less material is required per mile of pipe line covered. This important economy is but one of the many reasons why Barrett Enamels are the first choice of engineers who must measure their work in terms of cost per mile per year of service.

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IN THE

Financial Field

Oil company securities showing strength in cautious market.

* * *

Advances in price of East Texas crude, fuel and Diesel oil aiding.

OIL company securities as a group lately have been displaying noteworthy strength, in a general market that has been moving cautiously upward again.

The general tone has become more confident, and the oil shares have regained some of the exceptional popularity that they had in recent months.

There still remains considerable caution in the general trading and investing. However, it is noticeable that greater confidence prevails.

The discussions of a possible lull in business this summer or fall are tending to recede. But there remain some signs of reduced industrial and commercial activities, and consequently the markets are taking a conservative attitude.

Price Raise Encouraging

In as far as the oil company securities are concerned recent strength has been based partially on last week's increase in the crude oil price in East Texas. Similarly, interest in the oil shares was stimulated by the recent advance in fuel oil and diesel engine oil prices on the Pacific Coast.

However, this interest was tempered by indications that there would not be any general advance in crude prices in the immediate future, in either the Mid-Continent or in the Pacific Coast region.

The outlook on future crude prices remains somewhat clouded, since it is not definitely assured that the crude production will be brought down sufficiently to restore a balance between the supplies and the demand.

Opinions on Outlook

Many stocks in the recent decline reached new low levels for this year or for a longer period. Oil Company stocks showed a similar trend. It is believed by many that the prices will not drop below these recent low levels for some time to come, despite the hesitation and caution that has come into the situation.

One circumstance that stimulates interest in the oil company securities is the continued favorable earnings of the oil companies, with profits running at levels that compare closely with those in 1929. The oil companies, by virtue of favorable earnings, are paying this year comparatively attractive dividends; and they are expected to maintain similar disbursement in the remainder of this year. In addition, it appears likely that the oil companies will make substantial extra payments near the close of the year.

Reports Issued

Financial information that has come to light lately has included several more annual reports covering 1936, as well as additional reports on the first three months of this year.

Also, numerous companies recently have announced payments of dividends.

Standard of New Jersey

Standard Oil Company (New Jersey) in its annual report indicated that in 1936 the company earned a net profit of $97,774,583, equivalent to $3.73 a share on the outstanding stock. This compares with $62,863,192 or $2.43 a share earned in 1935.

The report of the Standard Oil Company (New Jersey) included some important statistics on the United States oil industry in 1936. Better results generally for oil companies were attributed to increased consumption, higher crude oil prices, and slightly better prices realized for products.

United States consumption of crude oil and products, including exports, was shown as having been 9.63 percent larger in 1936 than in 1935.

Total world consumption of crude oil and products showed an increase for 1936 of 10.02 percent. The weighted average price for crude oil in the United States for 1936 was $1.09 a barrel, compared with 97 cents a barrel in 1935.

The average tank wagon price of gasoline, exclusive of taxes in 50 cities, was 12.63 cents a gallon in 1936, compared with 12.02 cents a gallon in 1935. Supply and demands were practically in balance throughout the year, it was stated.

Gross production of the domestic and foreign subsidiaries of Standard Oil Company (New Jersey) and affiliated companies totaled 206,356,032 barrels in 1936, an average of 563,816 barrels daily. This figure included total production of these companies, and the Standard Oil Company (New Jersey) share in Iraq and one-half of the oil produced by Standard-Vacuum in the Far East. The figure excludes crude oil produced for partners. The 1936 gross production was 6.64 percent larger than in 1935.

The domestic production averaged 186,679 barrels daily, an increase of 9.69 percent. Foreign production averaged 377,137 barrels daily, an increase of 5.20 percent.

In 1936 the Standard (New Jersey) companies obtained 63 percent of their total production of crude oil by natural flow, 10 percent by air and gas lift, and 27 percent by pumping. At the end of 1936 the production was coming from 13,493 wells, an increase of 1096 wells over one year previously. Of these 9257 wells were in the United

Crude Reserves Increased

The Standard of New Jersey subsidiaries at the end of the year had combined crude oil stocks of 36,105,947 barrels, considered normal working stock. The companies at home and abroad showed for the year a net increase in their crude reserve of oil under ground.

The domestic subsidiaries at the close of 1936 were operating 4625 miles of trunk pipe line.

The combined sea-going fleet embraced 191 ships, aggregating 2,020,000 deadweight tons, representing 14 percent of the world tanker tonnage.

The Standard of New Jersey reported a slight improvement in results for the domestic refinery operations. The improvement was attributed to a moderate increase in prices of certain products, as well as to larger volume of business. The company's refineries in the United States ran approximately 130,000,000 barrels of crude during the year, or 354,742 barrels daily. This was an increase of 11.4 percent over 1935. Foreign refineries ran over 141,000,000 barrels of crude, or 385,956 barrels daily.

Arkansas Natural Gas

Arkansas Natural Gas Corporation and subsidiaries report for 1936 net income of $5,255,062, after usual charges. This compares with $2,394,609 for 1935.

Consolidated Oil

Consolidated Oil Corporation for the first three months of 1937 will show a profit of approximately $5,000,000, according to a statement of H. F. Sinclair, chairman of the executive committee, to stockholders in the annual meeting. This compares with approximately $3,300,000 earned in the similar period of 1936. He stated that he was optimistic on prospects for this year.

Stockholders of Consolidated Oil Corporation approved the resolution authorizing the directors to issue $50,000,000 of unsecured debentures, with rights to convert such debentures into common stock on the basis of not less than $25 a share of common stock.

Price Raised

EXPECTED TO BE CONFINED TO EAST TEXAS AREA

LATE last week the opinion had become generally accepted that the recent increase in crude oil prices in the East Texas field would be confined to that area.

There had been earlier in the week some expectation that the increase would be extended also to other sections of the Mid-Continent. But in meeting the 8-cent advance initiated in East Texas by Magnolia Petroleum Company, other major purchasers failed to include any advances for other fields.

It had been believed in some quarters that at least certain districts, enjoying favorable location, such as Southwest Texas and the Gulf Coast, might expect small increases, similar to that for East Texas.

Refined Prices Unchanged

In the latter part of last week, there had not yet occurred any advances in refined oil prices, which some had expected in consequence of the crude raise.

However, the market's for refined products noticeably strengthened following the crude raise; and it appeared quite likely that the prices would show some improvement in the near future.

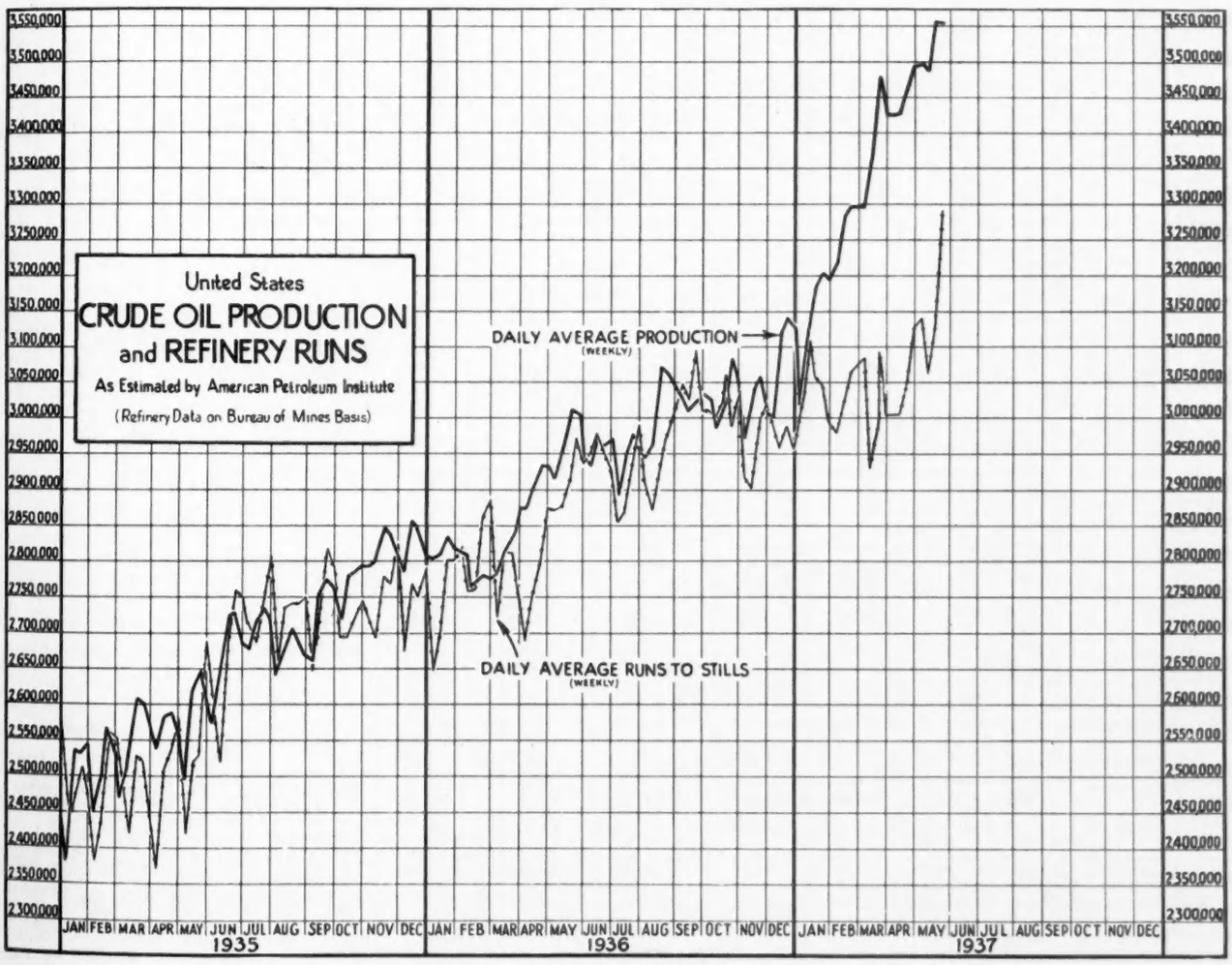
The increase announced for East Texas crude by Magnolia Petroleum Company, effective May 22, was generally unexpected. And since it came at the end of the week, many of the other major purchasers did not take action on similar increases until after the week-end.

The new price for East Texas crude, initiated by Magnolia, is $1.35 a barrel. The price previously was $1.27 a barrel, the posting that was inaugurated January 28, this year.

The East Texas advance was based primarily on a local tight crude market in that area, although further justification was furnished by the circumstance that better control of crude oil production for Texas and the United States looms for June.

Effective at the beginning of June, Texas will have a state allowable closely conforming with market requirements, as estimated by the Bureau of Mines. Similarly, other leading producing states are expected to exercise comparatively strict control of crude production during June.

The fact that the East Texas raise was not extended throughout the Mid-Continent was based, apparently, on



the recent excessive crude oil production. Every week since January 23, production has exceeded market requirements; and since that date, consequently, crude oil stocks have been increased more than 20,000,000 barrels. The Bureau of Mines reported that on May 15 crude oil stocks in the United States aggregated 305,365,000 barrels. That figure was 20,154,000 barrels greater than the 285,211,000 barrels on hand January 23.

This steady increase in crude stocks since the earlier part of the year naturally has tended to cause some concern in the markets. Although somewhat better control of crude production is in prospect during June, it still is not definitely assured that a perfect balance will be restored between production and demand.

Crude Runs at Peak

Refining operations, as well as crude oil production, have been greater than the markets have justified. In the week ending May 22, crude oil runs to stills reached a new all-time peak of 3,290,000 barrels daily. That was an increase of 155,000 barrels over the previous week's level, and was 150,000 barrels a day more than the previous all-time peak set in the week ended May 1.

CRUDE PRICES

Complete table of prices paid for crude oil at the well in principal fields will be found on page 134 of The OIL WEEKLY, May 3. Hereafter this Schedule will appear only in the first issue of each month except when changes are announced.

Gasoline Stocks Down

In the week ending May 22, total stocks of finished and unfinished gasoline aggregated 79,827,000 barrels, a decrease of 551,000 barrels for the week. This decrease was seasonal, and still left the stocks 10.1 percent larger than one year previously. This increase in gasoline inventories is largely although not entirely, justified by the gain that has occurred in consumption. In recent months the gasoline demand has been running around 10 percent larger than it did at the same time last year.

Fuel oil inventories are in a favorable position, and tend to make the fuel oil markets firm; and some further increase in prices appears likely. On May 22 total gas and fuel oil stocks stood at 95,111,000 barrels, having been reduced 205,000 barrels within the preceding week. Those stocks were more than 5,000,000 barrels lower than the 100,212,000 barrels on hand a year previously. The strength of the fuel oil market was demonstrated about two weeks ago, when prices were increased on the Pacific Coast.

East Texas Crude Raise

Despite the 8-cent increase recently put in effect in East Texas, there is some discussion currently of the possibility of still another increase there. There is active competition among purchasers for well connections, and it is said in some quarters that this rivalry may lead to further upward revision of the posted prices.

Magnolia Petroleum Company, in announcing its 8-cent increase, revealed that the advance was made because the company had been losing well connections, in consequence of the fact some other purchasers were paying premiums, and because the advance was needed for Magnolia to retain its connections.

Following the raise by Magnolia, a similar increase was posted by other purchasers, including : Tide Water Oil Company, The Texas Company, Shell Pipe Line Company, Humble Oil & Refining Company, Sun Oil Company, Atlantic Refining Company, Gulf Pipe Line Company, Sinclair Prairie Pipe Line Company, Stanolind Crude Oil Purchasing Company, Arkansas Fuel Oil Company, Atlas Pipe Line Company, Bell General Pipe Line Company, of Gladewater, Texas, subsidiary of General American Oil Company of Texas, Root Petroleum Company, De-Soto Crude Oil Purchasing Company, subsidiary of Grogan Oil Company, and others.

Mid-Continent Prices

In the latter part of last week, tank car prices in the Mid-Continent were largely the same as in the previous week. U. S. Motor gasoline f.o.b. Okla-

Weekly Trends of United States Production and Stocks

(Figures American Petroleum Institute, except crude stocks, Bureau of Mines)

WEEK ENDED—	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	Gas & Fuel Oil Stock (Barrels)
January 2, 1937	3,121,400	3,030,000	287,659,000	62,661,000	106,330,000
January 9	3,117,800	3,110,000	286,912,000	65,402,000	105,971,000
January 16	3,184,650	3,045,000	286,044,000	66,559,000	104,841,000
January 23	3,205,150	3,055,000	285,211,000	68,180,000	103,441,000
January 30	3,194,050	2,995,000	285,384,000	69,540,000	102,078,000
February 6	3,220,750	2,980,000	286,116,000	70,535,000	101,136,000
February 13	3,286,050	3,020,000	286,158,000	73,585,000	100,735,000
February 20	3,295,950	3,065,000	287,574,000	74,798,000	99,391,000
February 27	3,296,100	3,085,000	288,121,000	78,786,000	99,534,000
March 6	3,298,800	2,930,000	289,611,000	80,102,000	99,115,000
March 13	3,372,850	2,985,000	290,613,000	81,236,000	98,964,000
March 20	3,448,150	3,095,000	291,555,000	81,623,000	97,287,000
March 27	3,431,300	3,060,000	293,587,000	*83,538,000	96,591,000
April 3	3,422,350	3,005,000	297,374,000	83,157,000	95,805,000
April 10	3,426,300	3,005,000	297,468,000	82,579,000	94,581,000
April 17	3,463,550	3,055,000	298,932,000	82,703,000	94,472,000
April 24	3,496,400	3,125,000	300,737,000	82,303,000	94,100,000
May 1	3,497,450	3,140,000	303,249,000	81,407,000	94,291,000
May 8	3,489,200	3,065,000	304,148,000	81,469,000	94,874,000
May 15	*3,551,950	3,135,000	305,365,000	80,378,000	95,316,000
May 22, 1937	3,550,450	*3,290,000	.....	79,827,000	95,111,000
May 23, 1936	3,007,150	2,975,000	314,325,000	72,490,000	100,212,000

*All-time peak.

Summary of Wells Completed in the United States Week Ending May 29, 1937

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total, 1937	Total this Date, 1936
Alabama	.....	.....	.....	.....	.....	1	2
Arkansas	.....	.....	.....	.....	.....	32	36
California	26	23	.....	3	16,300	534	429
Colorado	.....	.....	.....	.....	.....	6	4
Florida	.....	.....	.....	.....	.....	.....	.....
Illinois	2	1	.....	1	100	37	4
Indiana	.....	.....	.....	.....	.....	45	97
Kansas	64	45	2	17	59,849	955	629
Kentucky	18	6	7	5	146	79	111
Louisiana	8	4	.....	4	1,839	309	426
Michigan	31	26	3	2	19,640	346	292
Mississippi	.....	.....	.....	.....	.....	6	2
Montana	3	3	.....	.....	411	51	46
Nebraska	.....	.....	.....	.....	.....	.....	.....
New Mexico	16	13	1	2	26,132	288	213
New York	.....	.....	.....	.....	.....	4	.....
Ohio	20	8	7	5	141	592	818
Oklahoma	78	58	4	16	62,621	1,275	1,098
Pennsylvania	3	2	.....	1	205	68	.....
Texas	292	215	10	67	294,912	5,914	5,015
Utah	.....	.....	.....	.....	.....	.....	.....
West Virginia	13	2	9	2	15	351	294
Wyoming	2	1	.....	1	5	45	19
Total this week	576	407	43	126	482,316	10,938	9,536
Total last week	549	390	48	111	538,763	.....	.....
Total this year	10,938	7,502	909	2,527	9,394,560	.....	.....

Comparison of Permits Granted for New Wells

STATE	Week Ending May 29	Total this Mo.	Total this Year	Total this Date Last Year	1936 Year Total
Arkansas	4	16	72	47	103
California	41	179	633	380	1,054
Louisiana	60	208	500	509	1,107
Kansas	67	331	1,089	742	1,873
Michigan	14	103	385	282	762
Oklahoma	60	357	1,245	1,258	2,594
Texas	462	2,027	7,563	5,869	15,582
Total	708	3,221	11,487	9,087	23,075

New Peak Reached

3,564,575 BARRELS PER DAY PRODUCED IN U.S. LAST WEEK

OVERPRODUCTION of crude oil continued during the week ended May 29, as the output for the United States climbed to a new all-time peak of 3,564,575 barrels daily.

That was 20,675 barrels a day more than the daily average production in the previous week, and 231,675 barrels a day more than the market requirements as estimated by the Bureau of Mines.

This high production rate for last week very likely resulted in a continuation of additions to crude oil storage, which have been under way for about four months, with the country's oil wells putting out more oil than the markets have been absorbing.

The excessive production undoubtedly was at least partially responsible for the failure of the recent crude price advance in East Texas to extend also into other districts.

Similarly, prospects for a general crude raise in the weeks ahead depend largely on the future trend of crude production. Although production allowables of the leading producing states for June give promise of a better balance between production and demand, it remains to be seen how closely actual production will conform with the consumer demand.

The substantial increase in production last week resulted from gains in Texas, Oklahoma, and Kansas that outweighed small declines in Louisiana, California, and New Mexico.

Averaging 1,423,600 barrels daily, Texas output last week was 9,500 barrels a day higher than in the previous week, and 82,800 barrels a day above the Bureau of Mines recommendation.

Oklahoma production rose 11,050 barrels to 660,775 barrels daily, and was 38,075 barrels a day above the indicated demand.

Kansas last week averaged 202,675 barrels daily, which was 5125 barrels a day more than in the previous week and 15,575 barrels a day more than the Bureau of Mines recommendation.

Louisiana production was down 3000 barrels in averaging 243,500 barrels daily, and it was under the federal allocation 5900 barrels.

California registered a decrease of 3500 barrels, averaging last week 656,500 barrels a day. That was 73,200 barrels a day more than the output suggested by the federal bureau.

New Mexico last week produced, on the average, 113,700 barrels daily, or 100 barrels a day less than in the previous week, and 13,900 barrels a day more than the Bureau of Mines recommendation.

United States Crude Oil Production

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Recommendation (Daily in May)	ACTUAL PRODUCTION: BARRELS DAILY FOR WEEK ENDING May 29	May 22
TEXAS—			
Texas Panhandle	.....	81,300	80,400
North Texas	.....	73,700	71,200
West Central Texas	.....	32,800	32,800
West Texas	.....	208,300	208,900
East Central Texas	.....	123,400	122,100
East Texas Field	.....	462,400	461,200
South Texas	.....	234,900	232,900
Texas Gulf Coast	.....	206,800	204,600
Total Texas	1,340,800	1,423,600	1,414,100
OKLAHOMA—			
Oklahoma City	.....	165,275	169,525
Seminole Area	.....	101,425	126,575
Crescent	.....	12,125	11,375
Lucien	.....	14,300	14,350
Fitts	.....	101,775	89,225
Edmund	.....	21,200	19,650
Moore	.....	13,100	12,750
Others	.....	231,575	206,275
Total Oklahoma	622,700	660,775	649,725
KANSAS—			
Ritz-Canton	.....	5,200	5,100
Chase	.....	9,475	8,975
Hollow-Nikkel	.....	2,525	2,475
Sedgwick	.....	4,325	4,475
Burrton	.....	15,275	14,100
Lorraine	.....	4,975	4,650
Russell County	.....	31,525	31,025
Silica	.....	22,125	21,450
Others	.....	107,250	105,300
Total Kansas	187,100	202,675	197,550
LOUISIANA—			
North Louisiana	.....	77,000	77,200
South Louisiana	.....	166,500	169,300
Total Louisiana	249,400	243,500	246,500
ARKANSAS	28,500	27,125	27,125
CALIFORNIA—			
Long Beach	.....	60,000	60,000
Santa Fe Springs	.....	43,500	44,500
Huntington Beach	.....	36,500	37,500
Dominguez	.....	23,500	25,500
Inglewood	.....	16,500	15,500
Ventura Avenue	.....	34,500	35,500
Seal Beach	.....	10,000	9,500
Midway-Sunset	.....	74,000	74,000
Elwood	.....	9,000	9,000
Kettleman Hills	.....	81,000	84,500
Mountain View	.....	18,500	19,500
Playa del Rey	.....	9,000	9,000
Others	.....	240,500	236,000
Total California	583,300	656,500	660,000
MOUNTAIN STATES—			
Wyoming	49,000	53,800	52,300
Montana	15,200	16,200	16,400
Colorado	4,800	3,700	4,400
Total Rocky Mountain States	69,000	73,700	73,100
NEW MEXICO	99,800	113,700	113,800
EASTERN STATES	117,400	118,200	116,900
MICHIGAN	34,900	44,800	45,100
Total United States	3,332,900	3,564,575	3,543,900

homa refineries, was moving within price ranges approximately as follows: 5⅛ to 5¼ cents a gallon for 62 octane and below; around 5½ cents for 63 to 67 octane, and 6⅛ to 6¼ cents for 68 to 70 octane.

Corresponding prices in the Chicago market were: 5 to 5¼ cents, 5¼ to 5½ cents, and 5⅞ to 6⅛ cents.

In East Texas the usual 60-62, 400 end point gasoline continued at 5¼ to 5⅜ cents a gallon, f.o.b. refineries.

TO BUILD TERMINUS

Kansas City, Kansas.—Great Lakes Pipe Line Company was granted permission to construct a terminus for a 200-mile pipe line from Barnsdall, Oklahoma, in this city May 24. The eight-inch line, which runs through Paola and Humboldt, is to be used for emergencies only.

OKLAHOMA FIELDS

Fitts extended west, south and northeast.

* * *

Gilcrease sand at Fitts proved productive.

* * *

Third sand may produce at Tulsa airport.

Tulsa.—Top honors in drilling activity for this part of Oklahoma went to the Fitts field of Pontotoc County last week where two extensions were reported, with a third minor extension to the south indicated. In the new area south of Fitts, the second well there looks to be better than the discovery well.

First of the extensions was Skelly Oil Company's Metropolitan Life Insurance Company 1-C, SE NW SE 23-2n-7e, which found the Hunton lime at 3613 feet and had saturated pay from 3642 to 3743 feet. More lime was found between 4009 and 4015 feet, and the well was bottomed at 4017 feet, two feet in the Sylvan shale. Acidized with 5000 gallons, the well produced 3359 barrels of oil, flowing 207 barrels of oil the first hour. It is the most northeasterly producer in the field.

Second extension well for the area was Burke-Greis Oil Company's Chambers 3, NEc NW NW 26-2n-6e, originally drilled to 4391 feet in the Bromide. The well was plugged back to 3867 feet and casing perforated in the Hunton lime, following which it was acidized. The well flowed 188 barrels of oil the first hour; 166 barrels the second; 168 barrels the third and 169 barrels the fourth hour, establishing a potential of 4075 barrels of oil. It is the farthest west producer in the field.

Another extension well was Magnolia Petroleum Company's Chambers 1, NW SW NW 36-2n-6e, which pushed the Hunton lime zone one location south, it being the most southwesterly test in the field. Chambers 1 had Hunton lime at 3916 feet and went into the Sylvan shale at 4139 feet. It drilled to 4144 feet and flowed 740 barrels of oil natural in 21 hours through tubing. The well is a south offset to Burke-Greis Oil Company's Chambers 6, which made a potential of 4255 barrels of oil from the Hunton lime.

Shallower Sand May Produce

A similar condition to that which has lately developed in the Oklahoma City field may be in the future activities of the Fitts field. It is the production of oil from a shallow sand above the prolific Wilcox. Such possibilities were opened in the field last week by Louall Drilling Company's Cradduck 3-A, SW NE NE 25-2n-6e, which had the Gilcrease sand between 1870 and 1885 feet and flowed 75 barrels of oil in nine and one-half hours. The shallow formation may prove to be of great benefit when and if the lower zones play out. Tubing was being run at the well, which was to take potential.

E. H. Moore's Thompson 1, NW SE SE 33-2n-7e, looks to be better than the discovery well of the new area south of production in the field. The well flowed 78 barrels of oil the first hour and 64 barrels the second hour, production coming from the Hunton lime at 4127 feet, through tubing. It had previously been given two acid treatments of 10,000 gallons each, and flowed 471 barrels of oil in eight hours on gas lift. In 16 hours the well made 286 barrels of oil natural on gas lift and 160 barrels through tubing.

Carter Oil Company's Thompson 1, CS½ NE NW 34-2n-9e, in the Centrahoma area of Coal County, may be completed as a commercial producer if plans of operators work out. The well was originally drilled to 7126 feet, and was shut down for several months after making a few disappointing shows. The well, when last reported, was bailing at 5750 feet and was showing about 200,000 cubic feet of gas, coming from the old bromide section. It will be plugged back to 3950 feet, casing perforated and the Viola lime acidized.

In Hughes County, Carter Oil Company's Hamilton 1, CWL NE SW 33-4n-9e, in the Citra area, was drilling at 5914 feet in bromide lime. A core taken between 5757 and 5764 feet showed dolomitic lime containing a slight showing of oil and gas. The well had similar showings in another core taken from 5764 to 5771 feet. It was tested at 5890 feet, and when opened for 2 hours, showed 135 feet of mud with no oil, gas or water. The second sand was topped at 5829 feet.

Tulsa Airport Field

Some minor developments kept interest alive in the Airport pool, northeast of Tulsa. M. J. McNulty, Jr.'s Stroman 3, SW NW NE 35-20n-13e, looked to be the northeast extension well for the pool, having found a good show of oil in a tight sand between 1020 and 1036 feet. It was given a shot and looks good for about 25 barrels of oil daily. It was drilled to 1044 feet.

A west offset is being started by Galbraith & Byers et al at C. E. Turner 3, SE NE NW 35-20n-13e, and McNulty has moved in machine for Mathey 1, SWc SE SE 26-20n-13e, and was rigging up.

Operators in the shallow area are watching for a possible linkage between the Airport pool and the Dawson, Mohawk and Flat Rock pools, north of Tulsa and near Dawson. The well drilling in the area is Hausam-Swanda Drilling Company et al's Cecil 1, SWc 22-20n-13e. The test was spudded last week.

Production is indicated from a third pay formation in the field, the Red Fork sand. First show in this sand was at Haynes et al's Evans 1, NWc SE NW 3-19n-13e. The well was drilled to 1152 feet, then plugged back to 936½ feet. Between that depth and 948½ feet, the well made a good show of gas.

Mid-Continent Petroleum Corporation's Elizabeth 3, Nec SW 20-7n-8e, in the West Holdenville area of Hughes County, topped the Booch sand at 2880 feet and cemented 7-inch casing at 2883 feet. The well was drilled to 2912 feet with about 300 feet of oil in the hole. It swabbed 65 barrels of oil in 24 hours, and operators plan to shoot the pay formation.

The same company's Logan 1, NEc SE 31-11n-5e, east of the Shawnee pool of Pottawatomie County, topped the Wilcox sand at 4839 feet and drilled to 4844 feet, where it pumped 180 barrels of oil and about 90 barrels of water in 14 hours. It was shut down for repairs to drilling equipment.

Franchot et al's Franklin 1, SE NW SE 20-18n-9e, in the Mannford area of Creek County, topped the Dutcher sand at 2914 feet and found it dry. Top of the Wapanucka lime was had at 2990 feet and was saturated with oil. After topping the Mississippi lime at 2999 feet and drilling to 3007 feet, no increase in production was noted.

Ask commission to set up fifth Oklahoma City sand

Oklahoma City.—Establishment of a fifth oil producing zone for the Oklahoma City field came before the Oklahoma Corporation Commission May 28 on petition of the Indian Territory Illuminating Oil Company. The concern is seeking to have the third Tonkawa sand designated a Class C pool, following a successful perforation job of its No. 2 Elizabeth Theimer, NW SW NE, 1-11n-3w. It was plugged back from the Lower Simpson formation and perforated between 4396 and 4418 feet. Tests made May 8 showed bottom pressure of 1910 pounds with shutin pressure of 1500 pounds. The well made 2612 barrels in 24 hours. Since then it has been tubed and tests have been continued for determining the gas-oil ratio.

Locally the formation is known as the Theimer sand from the lease name of the well producing from the latest addition to sources of oil for the field. It checks, however, with the Tonkawa series, two of which are gas sources at Oklahoma City.

Petition of the company was based on this, "that the applicant plans to plug other wells back to said common source of supply and it is reasonable to consider that other operators will do likewise."

Of the 1040 wells now producing at Oklahoma City, 340 are in formations whose output is so low that plugging back will depend on chances of finding

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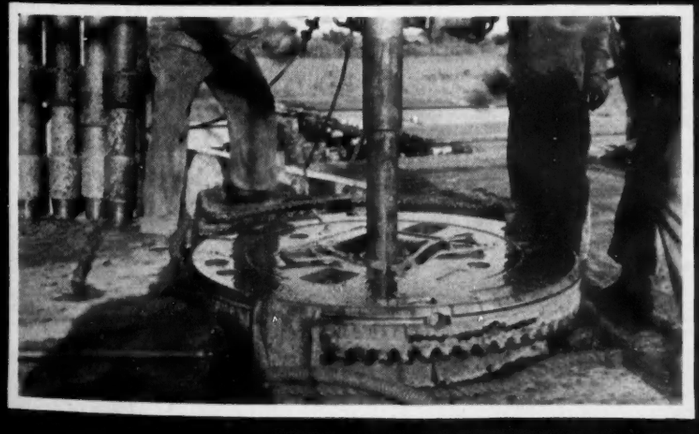

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the third Tonkawa member productive. The lower Simpson sand still has 304 producing wells in the field with daily allowable of 20,000 barrels. The upper Simpson dolomite has but 10 wells and their allowable is 2100 barrels. There are 26 wells in the Cleveland zone and these have allowed production of only 900 barrels. The Indian Territory Illuminating owns 163 of the lower Simpson producers.

Extent of area of the third Tonkawa sand cannot be determined from present information. While the field was under intensive development the full effort of drilling was to get down to Wilcox sand or the Simpson formations to take advantage of their high yield. On that account coring and minute log keeping were not considered of importace.

The fact that the owner of the first well sought classification of the formation as a common source of the for- indicates that producers look upon the possibility of oil recovery with favor. Class C designation puts a field under supervision, which requires orders, rules and regulations for the prevention of waste as well as the prevention of inequitable or unfair taking oil from a common source of supply.

OKLAHOMA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CARTER COUNTY—		
Lykins & Wakefield, Luke 1-B, sw nw sw 9-1s-2w	1	275
Gulf, Berry 1, ne ne nw 5-1s-3w	328	3205
Skelly, Higgens 2, sw nw nw 8-2s-2w (pb 2505)	18	2800
Simpson Fell, Davis 4, ne sw nw 9-2s-2w	85	1725
Kewanee O&G Co., Jones 16, nw ne sw 4-4s-3w (pb 875)	*	1189
Ferguson 9, nw se nw 6-4s-3w (pb 1112)	44	1124
Sinclair Prairie, Mulins 19, csl n½ se ne 4-4s-3w	20	1061
Shell, Horton 16, csl sw ne 6-4s-3w	70	1160
Pure Oil, Westheimer & Daube 25, nw nw nw 10-4s-3w	13	1107
CLEVELAND COUNTY—		
Sinclair Prairie et al, Bagby 3, sw se nw 27-10n-2w ....¶23 &	13,432	7314
CREEK COUNTY—		
Shaw, Doke & Hughes, White 2, sw se sw 24-17n-7e ....¶6½		2540
C. L. Jordan, Harjo 2, sw ne sw 13-17n-8e (otd 227) (pb 2343)	8	2786
Wilcox O&G, Hope 2, sw nw sw 3-17n-9e	45	2087
Pure Oil, Crowe 18, se sw se 4-18n-7e	*	2721
Link Oil, Micky 9, cwl nw 33-18n-7e (otd 1426)	10	1660
Big Four Pet., Kizer 5, ce½ ne 14-19n-7e	30	2650
Sinclair Prairie, Oates 2, se se ne 14-19n-9e	25	1303
GARFIELD COUNTY—		
Shell et al, Tate 1, cse nw 36-21n-3w	330	5382
GARVIN COUNTY—		
Westheimer, Pearce 1, nw ne sw 13-1n-3w	*	1707
Simpson Fell Oil, Derdyn 2, nw se nw 17-1n-3w (pb 1655)	7	1805
Cox & Mayhmon, Craig 1, se ne nw 32-1n-3w (pb 2300)	330	2847
HUGHES COUNTY—		
Winona O&G, L. Harjo 2, se se nw 20-7n-8e	125	2937
JACKSON COUNTY—		
Gulf, Edwards 4, se ne se 3-1n-20w	76	1555
JEFFERSON COUNTY—		
Palmer & Palmer, Barnett 2, se sw sw 19-6s-5w	40	1522
Campbell et al, Trout 3, ce½ e½ ne 6-8s-7w	*	2206
LINCOLN COUNTY—		
Amerada & Stanolind, Angell 1, ne ne sw 35-14n-6e	180	4207
LOGAN COUNTY—		
Texas Co., C. W. Denny 5, ne nw se 33-17n-4w (pb 6270)	*	6723
Ohio Oil, Knight 1, se ne sw 12-17n-1w ....¶42½		5055
Amerada et al, Fouts 2, se ne ne 14-17n-1w	339	5180
Eason Oil, Sisters 1, sw sw sw 24-17n-1w	*	5550
MUSKOGEE COUNTY—		
Garrett, Gilbray 1, sw nw ne 13-13n-15e	*	2810
Armstrong et al, Roberts 1-A, se se se 16-14n-16e ....¶12		1657
NOBLE COUNTY—		
Tide Water Oil, Hackett 4, ne sw se 21-23n-2w ....¶5¼ &	5340	4330
OKFUSKEE COUNTY—		
Sinclair Prairie, Phillips 24, se se ne 24-10s-8e	55	1880
Champlin, Maudie 1, se se sw 7-9n-10e	10	1872
Okla. Oil Corp., Morris 1, ne sw sw 8-10n-9e	*	1936
J. F. Smith, Ott 1, sw sw sw 8-10n-9e (otd 1888)	19	1899
W. B. Wells, L. Moore 6, cwl se ne 14-10n-11e (pb 1590)	8	2540
Kingwood, Yahola 1, ne ne se 25-11n-9e (pb 1582)	*	1616
OKLAHOMA COUNTY—		
I. T. I. O., Theimer 2, nw sw ne 12-11n-3w (pb 4450) ....¶33 &	1500	6368
Gault Brown, Turk 1, nw ne sw 20-13n-3w ....¶12 &	6174	6670
Jones & Shelbourne, Williams 1, se se sw 20-13n-3w ....¶5 &	4632	6690
Ohio Oil, C. R. Rankin 3, nw se sw 31-14n-3w ....¶2½ &	836	6710
OKMULGEE COUNTY—		
Reliance Oil, Anthis 2, se nw ne 27-16n-11e (otd 2274)	*	2984
Bingham et al, Grayson 1-A, nw nw sw 34-14n-14e	5	1187
Ladd, Town Jr. 2-A, sw se nw 27-15n-14e	35	1709
Craig et al, Dunn 1-A cnl nw ne 21-23n-14e	30	1642
OSAGE COUNTY—		
Grey & Tolson, 1, se sw nw 27-21n-9e	10	1065
Pure Oil, 7, nw ne ne 19-22n-10e	*	2230
172, ne nw se 5-23n-8e	40	2525
Lewis & Texas, 9, se nw se 17-24n-7e	144	2651
Lewis Prod., 2, sw nw nw 34-24n-7e	151	2670
PAWNEE COUNTY—		
Deep Rock et al, Hawk 2, nw sw ne 4-18n-5e	5	3476
J. L. Reynolds, Hamilton 13, nw sw ne 24-20n-8e (otd 1154) (pb 1158)	2	1505
PAYNE COUNTY—		
Mulberry Oil, O. Herin 2, sw nw ne 5-17n-5e (pb 3537)	*	4123
PONTOTOC COUNTY—		
Mid-Continent, Statler 2, ne se sw 2-1n-7e ....¶6½ &	1578	4537
Statler 4, se ne sw 2-1n-7e	*	1142
Fleetborn, Lewis 2, sw se sw 19-2n-7e ....¶1½ &	466	4310
Magnolia, Morrin 2, sw ne se 20-2n-7e (pb 4115) ....¶1½ &	3139	4175
Morrin 3, se nw se 20-2n-7e (pb 4125) ....¶2 &	2055	4444
Moore, Frazier 1, ne sw nw 23-2n-7e ....¶4¾ &	5861	3859
Shell, Bates 2, ne ne nw 26-2n-7e (pb 3960) ....¶4 &	4183	4366
Magnolia, Simpson 19, sw se ne 29-2n-7e	339	2550
Blackstock, Hardin 5-A, nw se nw 30-2n-7e 1711		3707
Magnolia, Hardin 14, nw ne nw 30-2n-7e ....¶1¾ &	1195	4410
Delaney et al, P. A. Norris 1, nw nw se 18-4n-8e	¶1	700
Mary "F" Oil, cnw se 16-5n-8e	6	947
POTTAWATOMIE COUNTY—		
Gulf, Benjamin 2, nw se nw 13-7n-4e	640	4167
Olson Drlg, Junk 2, nw se se 32-11n-4e	166	4420
Tom Phillips, Breidenthal 2, cel nw ne 23-11n-6e (pb 4350)	573	4543
SEMINOLE COUNTY—		
Wood, Mayhue 1, ne ne ne 14-9n-6e (pb 3480)	*	4024
Creekmore, Campbell 1, sw nw nw 20-9n-7e (otd 3468)	300	4089
Amerada et al, Noble 3, se se sw 25-10n-7e ....¶1½ &	1640	3632
Pryor 4, ne ne nw 36-10n-7e ..¶1 &	2187	3619
Sinclair Prairie, Rossanna 1, nw nw sw 28-10n-8e 2024		4189
STEPHENS COUNTY—		
E. W. Stephens, Fee 3, sw sw sw 3-2s-5w	6	993
TILLMAN COUNTY—		
Cavine, Goehler 1, sw nw ne 4-5s-14w	*	1366
TULSA COUNTY—		
Somerset, Depriest 3, nw sw ne 35-17n-12e	*	2354

*Failures; †Junked; ¶Million cu. ft. gas.

Shallow oil discovery accelerates lease play

Tulsa.—Discovery of shallow production in western Kiowa County has given further impetus to a leasing play which has spread over southwestern Oklahoma. E. A. Debolt and Associates' Burnett 1, SE NW SE 30-7n-21w last week was bailing free oil from 982 feet. It had Granite Wash from 952 to 970 feet, where gas was found. The well looks good for 50 barrels of oil and 1,000,000 cubic feet of gas upon completion.

This well is across the north fork of the Red River from the old Granite pool, which has been producing oil intermittently since 1901. Production there was discovered in the drilling of water wells. The oil is of low gravity and has been sold chiefly by tank wagon and truck delivery.

West of Granite pool, Greer County, Principle Oil Company's Schierloh 1, SE NE SE 28-7n-20w, has been shut down for a test after finding both oil and gas between 964 and 1024 feet.

Both these tests are north of Altus field, Jackson County, which has been extensively drilled for small output wells with depths between 1400 and 1650 feet. The Granite Wash as well as lime formations are productive in this field.

The leasing play of southwestern Oklahoma runs from the Washita mountains of Comanche County through Kiowa and Washita Counties to the northwest. Maps indicate that three-fourths of Washita County is under lease. Shooting crews have been in the area for a year, and five are still at work in Washita County. Three large blocks are being assembled.

Magnolia Petroleum Company is drilling deeper in the Tillman County test, Brown 1, SW SE NE 21-3s-18w, after taking a core at 6303 feet. Two weeks ago the hole had a show of oil at 5410 feet.

Logan and Noble Counties are active

Oklahoma City.— Logan and Noble counties continued to hold the spotlight in active drilling in the Oklahoma City area. The Texas Company's Denny 5, NE NW SE 33-17n-4w, in the Crescent pool, topped the Wilcox sand at 6288 feet and went into the dense lime at 6600 feet. The Dolomite was found at 6612 feet; second Wilcox sand at 6704 feet and the well was carried ahead to 6723 feet. After water was encountered at that depth, the well was plugged back to 6250 feet and casing perforated between 6060 and 6230 feet in the Hunton lime and acidized with 2000 gallons. The test then flowed 40 barrels of oil in two hours net and went dead. Reacidized with 10,000 gallons, it was given a 335 barrel oil load and put on gas lift. Operators recovered 190 barrels of the load in 27 hours, which was cut by 20 percent water, following which the well was shut down for orders.

Champlin Refining Company's Pfeiffer 3, SE NE NW 4-19n-2w, in the Logan County portion of the Lucian pool, topped second Wilcox sand at 4965 feet and drilled to 5068 feet where it produced 1380 barrels of oil in 24

hours. It was then deepened to 5073 feet and made a new flow of 3849 barrels of oil in 24 hours. Drilled ahead to 5090 feet, the well flowed 3229 barrels of oil and 9,000,000 cubic feet of gas in 17 hours. During the first three hours of a potential test the well made 346 barrels the first hour; 255 barrels the second hour and 241 barrels the third hour. Gas was estimated at 12,500,000 cubic feet.

Phillips Petroleum Company's Pfeiffer 3, SW NW NE 4-19n-2w, topped the second Wilcox sand at 5079 feet and after unloading the hole flowed 844 barrels of oil and made 8,000,000 cubic feet of gas in five hours.

Another well which has been attracting considerable attention was Mid-Continent Petroleum Corporation's Dobson 1, SEc 11-17n-1w, Logan County, which continued to bail after drilling the plug at 5082 feet in the Wilcox sand. Gas increased when the fluid had been lowered to the 2000-foot level, and the well headed up, making three flows into pits, some oil being found in the fluid. The well was then shut in to allow a pressure build-up, following which it made 180 barrels of oil in 17 hours, by heads. It had gas estimated at 1,000,000 cubic feet. During the last 24-hour test, it flowed 223 barrels of oil by heads.

In the next section, Ohio Oil Company's Knight 1, SE NE SW 12-17n-1w, which made 42,500,000 cubic feet of gas from between 5032 and 5056 feet, was shut in and will be completed as a gasser.

Transwestern Oil Company et al's Randall 1, SWc NW 24-16n-1w, in the Meridian area of Logan County, topped Viola lime at 5395 feet and cored from 5445 to 5460 feet, recoverng eght feet of dolomite showing some oil and gas. It was drilling ahead below 5470 feet.

Sinclair Prairie Oil Company et al's Marvel 3, NW NE NE 21-10n-2w, in the Moore pool of Cleveland County, cleaned out to 7262 feet, the total depth in the Wilcox sand. It was bailed down and was making about 10 barrels of oil an hour with 1,500,000 cubic feet of gas. A 24-quart shot was run into the hole but went off unexpectedly. The well made 365 barrels of oil in 20 hours following the shot. It will be shot again with 100 quarts.

The company's Bagby 4, SWc NW 27-10n-2w, was acidized at 7268 feet in the Wilcox sand and when opened for 50 minutes, cut out connections, flowing 480 barrels of oil and 23,000,000 cubic feet of gas. During a previous 24-hour test it made 839 barrels of oil and 8,500,000 cubic feet of gas. At 7278 feet, it was acidized once more with 6000 gallons and when opened, made 354 barrels of oil in 19 minutes with 70,000,000 cubic feet of gas. The gas again cut out connections and the well was shut in.

Gulf Oil Corporation's Allen 1, NE SW SW 27-10n-2w, took a second potential through casing and made 6413 barrels of oil in 24 hours with 16,000,000 cubic feet of gas. The well was originally completed in April for 3600 barrels of oil, production coming through tubing from a plug-back depth of 7249 feet in the Dolomite.

KANSAS FIELDS

Bloomer well flows 1275 barrels six hours.

* * *

Largest Barber County well is completed.

Wichita.—Drilling activity was fairly quiet in the Sunflower state last week, bulk of the reports concerning the completions of several good wells and one well in particular, which received the largest potential given any well in the state in the past few months.

The big producer was Yarnell & Spencer's Patzner 3, NWc SE NE 36-17s-11w, in the Bloomer pool of Barton County, which had the Kansas City lime from 3035 to 3071 feet and flowed 625 barrels of oil natural. Acidized with 5000 gallons, the well made 1275 barrels of oil in six hours. The test is a south offset to Skelly Oil Company's Bloomer 9, which was coring ahead below 3020 feet. When Patzner 3 completed its potential, it rated 6488 barrels of oil daily.

Largest Barber Well

Olson Oil Company and Vaccars Oil Company's Whelan 1, SWc NW 29-31s-11w, four miles northeast of the Medicine Lodge pool of Barber County, came in as a good producer. The well filled 2100 feet with oil in one hour after the plug was drilled at 4302 feet in the top of the chat. It was at 4316 feet and in a 20-minute flow, put 38 barrels of oil in tanks, and flowed 240 barrels of oil in three hours. On the basis of the three-hour flow, the well is judged good for 1920 barrels of oil, making it the largest producer in the county to date. It is an east offset to a recent extension well there. Swartz 1, which was completed for 941 barrels of oil.

Stanolind Oil & Gas Company's Kowalsky 1, NWc NE 11-20s-11w, generally accepted as the connecting well between the Ellinwood, Peter and Silica pools of Barton County, pumped 115 barrels of oil in 55 minutes from the Siliceous lime at 3282 feet, then flowed 60 barrels of oil in one hour. The well is approximately one mile from the nearest production.

Morgan & Flynn and others completed Arnold 1, NWc 30-18s-15w, in the Albert area of western Barton County, for 18 barrels of oil and 12,750,000 cubic feet of gas from the Lamont sand at 3536 feet. In the same area, Harris & Haun's Haas 2, NWc SW 30-18s-15w, was dry and abandoned at a total depth of 3540 feet.

C. L. Price et al's Kraft 1, SW NW NE 10-17s-11w, north of Claflin, made 1890 barrels of oil from the Siliceous lime at 3389 feet. The potential was later set at 1904 barrels of oil.

Stanolind Oil & Gas Company's Struder 1, SEc SW 26-16s-13w, three miles northeast of production in the Ainsworth pool, topped the Siliceous lime at 3402 feet and cored to 3409 feet where it had a small show of oil. It was coring ahead.

Sinclair Prairie Oil Company's Nett 1, NWc SE 32-26s-4w, south of production in the Hilger pool of Reno County, was abandoned at 4184 feet in the Siliceous lime. Top of the formation was at 4156 feet.

Barnsdall Oil Company's Westphal 6-A, CSL SE 19-24s-4w, in the Burrton pool, drilled to 3384 feet and was acid-

Oklahoma Quota

[*Continued from page 11*]

at Fitts, which would bring allowable down to 89 barrels per well. By June 15 he testified that the Hunton lime would have 283 producers and that the allowable would be brought down to 85 barrels per well to keep within the 24,000 barrels daily.

The situation at Moore, the new Cleveland County pool, was brought before the hearing by T. L. Reagan, engineer for Stanolind Oil & Gas Company, who said the bottom-hole pressure there had dropped from around 2600 pounds to 1700 pounds. He recommended that Moore be reduced to 10,000 barrels daily instead of 13,000 for 30 days and that an engineering committee study the pressure situation. His testimony was that in some instances well pressures were dropping from 8 to 10 pounds daily.

Well output in the Moore field is the highest in the state, as it has but 23 producing wells to fill the requirement of 13,000 barrels daily from a potential of 517,779 barrels.

The order finally written left both Moore and the Hunton lime at Fitts unchanged. The 2600 barrels total increase for the state was distributed between other fields. A few minor reductions allowed for some shifting to give newer fields a little more oil.

As finally worked out the Class D, wildcat pools, gained 2100 barrels daily over May, the unprorated, stripper well pools, were given 1100 barrels increase daily, while the unclassified pools, which are prorated by agreement, were reduced by 600 barrels daily.

ized with 15,000 gallons. It made a potential of 508 barrels of oil during a 16-hour test.

Shell Petroleum Corporation's Whipple 4, NWc 14-26s-9w, in the Lerado pool, was completed for 2601 barrels of oil from th Viola lime. The company's Lee 3, SWc SE 10-26s-9w, was completed for 2666 barrels of oil from the Viola lime.

Phillips Petroleum Company's Astle Island 1, in Section 19-24s-4w, on an island in the Arkansas river and in the Stone sector of the Burrton pool of Reno County, was spraying oil found between 3372 and 3381 feet in the chat, top of which was found at 3320 feet. Three other tests are drilling on the lease.

Bridgeport Machine Company's Froelick 1, NWc SE 4-13s-16w, east of Hays in Ellis County, filled 2000 feet with oil after acidizing the Oswald lime at 3250 feet. It swabbed 10 barrels of oil an hour for 14 hours from a total depth of 3265 feet, it having been drilled ahead to that depth in the Kansas City lime.

Carter Oil Company's Staab 2, in Section 11-12s-18w, in the Walters pool, drilled to 3629 feet in the Siliceous lime and made 1695 barrels of oil in 23 hours. Phillips Petroleum Company's Staab 1, NWc NE 11-12s-18w, made a potential of 2200 barrels of oil from a total depth of 3630 feet in the Siliceous lime.

Union Oil & Refining Company et al's Baker 1, SWc NE 33-20s-6w, west of production in the Welch pool of Rice County, topped the chat at 3396 feet and had showings of oil from 3402 to 3407 feet, and more showings from 3432 to 3436 feet, the total depth. Casing was under-reamed from 3152 feet to the total depth.

The Texas Company's Hathaway 1, NW NE NW 34-19s-10w, one-quarter mile northeast of production in the Schartz sector of the Silica pool of Rice County, found water at 3324 feet in the Siliceous lime after drilling the plug. Operators are reported preparing to plug back to 3310 feet where some good showings of oil were had before casing was run and standard tools rigged up.

Barnsdall Oil Company's Hathaway 1, SW NW NE 33-19s-10w, in the Silica area, topped the Siliceous lime at 3272 feet, drilled to 3284 feet and was acidized with 1500 gallons. The well responded with a new potential of 2155 barrels of oil. It was originally completed for 1000 barrels.

KANSAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BARTON COUNTY—		
Ohio Oil, Kramer 1, sw sw se 9-16s-13w	320	3379
Spencer & Yarnell, Patzner "A" 3, nw ne se 36-17s-11w	2714	3246
Weaver et al, Stumps 1, ne ne ne 3-17s-12w	*	3383
Continental, Lamatsch 1, sw ne ne 26-15s-12w	*	3405
Carlock, Ehly 1, ne ne se 5-18s-11w (pb 3368)	*	3397
Carlock et al, Leibel 1, se ne se 18-18s-11w	*	3469
Harris & Haun, Haas 2, nw nw sw 30-18s-15w	*	3559
Herndon Drlg. et al, Arnold 1, nw nw nw 30-18s-15w	¶12½ & 18	3536
C. B. Davis, Wm. Steckel 8, ne ne se 1-20s-11w	984	3278
Stanolind, Meggars 1, sw sw sw 21-20s-11w	*	3373
I. T. I. O., Peters 3, se se nw 24-20s-11w	1604	3250
BUTLER COUNTY—		
Empire, Lathrop 25, ne se nw 17-23s-4e	400	2082
Roth & Faurot, Harris 1, ne sw se 14-27s-7e (pb 2715)	70	2720
National Ref., Sutter "A" 5, sw sw ne 1-28s-6e	192	3186
CHAUTAUQUA COUNTY—		
Sagamore, White "B" 3, cse nw 15-32s-12e	¶¼	1682
COWLEY COUNTY—		
Lloyd, Frost & Study, Carson 1, nw nw se 33-31s-3e	2714	3355
Wallace, Fee 1-A, sw se se 10-33s-4e	*	1450
ELLIS COUNTY—		
Sinclair Prairie, Romine 1, sw sw sw 7-11s-16w	960	3314
Margay Oil, Bemis "C" 2, sw ne sw 22-11s-17w	2383	3489
Darby Pet., Solomon 1, nw nw ne 33-11s-19w	655	3631
Lario O&G, Walter "C" 1, nw sw se 2-12s-18w	1415	3655
Kors et al, Koblitz 1, se sw nw 23-12s-18w	250	3689
ELLSWORTH COUNTY—		
Carter et al, Goth 4, sw sw sw 23-17s-9w	248	3197
FRANKLIN COUNTY—		
Texas, C. W. Zielsdorf 18, sw sw sw 9-16s-21e	15	678
GREENWOOD COUNTY—		
Spencer et al, Wahl 1, cs½ sw sw 32-23s-13e	*	1689
Guy Scott et al, Helleman 1, se ne se 6-26s-10e	25	2173
Balwanz, Travelers Ins. Co. 1, csw sw 23-26s-12e	*	2010
Van Deventer et al, Bemis 1-A, ne sw se 12-28s-11e	*	1315
HARVEY COUNTY—		
Shaffer et al, Steele 1, cw½ nw se 12-23s-2w	*	3615
McPHERSON COUNTY—		
Western Kansas O&G, Unruh 1, ne nw se 31-19s-1w	¶4	2974
Shell, Lindberg 2, cne ne 15-19s-2w	10	2919
Continental, Hetzke "A" 4, se se se 20-21s-1w	589	3326
Boechner 2, cw½ w½ nw 28-21s-1w	4548	3350
RENO COUNTY—		
Westgage, O'Sullivan 1, sw sw ne 24-23s-5w	*	3970
Empire, Schenczer 2, se ne nw 20-24s-4w	481	3392
Shaffer, Tucker 3, sw sw nw 20-24s-4w	1820	3382
Magnolia, Rodgers 4, sw sw sw 9-26s-4w	884	4022
Shell, Fee 3, sw sw se 10-26s-9w	2659	4139
Shell, Whipple 4, nw nw nw 14-26s-9w	3592	4134
RICE COUNTY—		
Continental et al, C. Wood 1, nw nw se 12-18s-8w	1729	3225
Empire, Bredfeldt 1, cn½ n½ sw 7-18s-9w	267	3240
Stanolind, M. Panning 4, sw sw nw 33-19s-10w	2382	3282
Sinclair Prairie, Knopp 2, ne ne nw 4-20s-10w	248	3336
Atlantic, Hopkins 1, se se sw 6-21s-7w	2050	3343
Derby, Thode 7, sw se se 8-21s-7w	1171	3379
Garden & Haines, Gossman 2, nw se nw 9-21s-7w	1925	3374
Texas Co., P. Schoonover 1, se se nw 6-19s-9w	*	3289
Reserve Dev., Patton 4, se nw nw 16-21s-7w	3619	3381
Sunflower Oil, Stang 2, ne sw nw 16-21s-7w	6023	3385
RUSH COUNTY—		
Schoenfeld & Ketch, Suppes 1, sw sw sw 14-16s-16w	*	3446
RUSSELL COUNTY—		
Central Pet., Deckert 3, sw ne nw 30-12s-15w	504	3085
Texas Co., M. Rusch 1, ne ne sw 9-14s-14w (pb 3078)	30	3303
Central Pet., Foster "B" 5, ne se ne 3-14s-15w	1152	3070
Stanolind, Dortland 3, nw ne se 5-14s-15w	591	3095
Transwestern Oil, K. Polcyn 1, nw nw nw 14-14s-15w	1197	3256
Darby Pet., Dumler "E" 1, ne se nw 36-14s-15w	*	3201
Carter, Deitrick 4, nw sw sw 8-15s-13w	1570	3188
Derby & Reserve, Michaelis 7, sw se nw 31-15s-13w	2814	3267
Gulf, Hoffman 1, ne ne sw 31-15s-13w	1662	3246
STAFFORD COUNTY—		
Stanolind, Komarek 4, sw sw se 30-22s-11w	1849	3585
Stanolind-Amerada, Holmes 1, se se ne 14-24s-13w	*	4233
Empire et al, Neiland 1, se se ne 16-25s-14w	3366	3836
WOODSON COUNTY—		
Katz et al, Guy 1, sw sw se 6-24s-15e	*	1643
Sheedy et al, College 1, nw ne se 28-25s-14e	150	1440

*Failures; †Junked; ¶Million cu. ft. gas.

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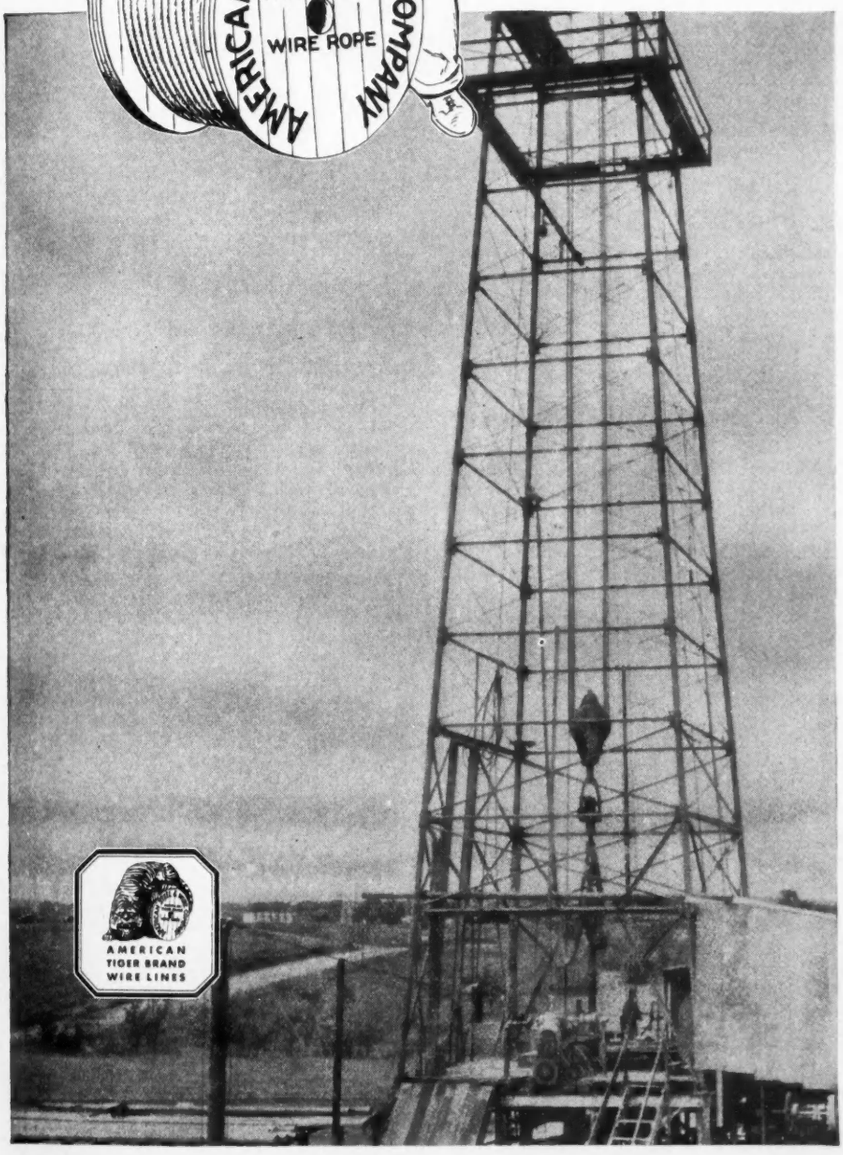

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NORTH AND WEST TEXAS

Structural relief forecasts Gaines County discovery.

* * *

Offset to Seminole's first well cleaning itself.

* * *

Light Oil in Lower Canyon lime in Wilbarger County.

Midland, Texas.—Sufficient structural relief is indicated by important geological markers logged by Amon G. Carter and Continental Oil Company's A. L. Wasson 1, northwestern Gaines County wildcat, to forecast the discovery of a new oil reserve for the north portion of the Permian Basin. This geophysical prospect is on a northwest strike and about 15 miles from two flowing wells on the Seminole structure near the center of the county. Top of first stringer of lime was logged by Wasson 1, SW SW NW Section 48, Block AX, PSL Survey, at 3830 feet, or 231 feet sub sea. This correlates more than 400 feet higher than the same marker logged by the producers and is about 450 feet higher than a 5224-foot failure drilled about four miles southwest last year by E. M. Wahlenmaier, York & Harper, Inc.

Wasson 1 logged a show of gas in the Yates sand, a favorable development for the district and has been rated as an important wildcat since first upper markers were revealed. Drilling was in progress near the 4600-foot level late last week.

Calls For More Drilling

Approaching lease expiration dates on acreage included in the favorable geophysical picture have forced additional drilling obligations. Carter and Continental Oil Company's G. M. Langdon Moore 1, SE SE NW Section 44, Block A-X, about 2½ miles northeast of Wasson 1, was drilling near the 1800-foot level. Continental Oil Company has made location for W. McCarty Moore 1, SWc Section 46, being on a line between the two active tests, and a fourth project has been made by Carter and Continental Oil Company to offset the latter. Leases require drilling by June 2.

Shell Petroleum Corporation's Mann 1, C NW NW W. T. Section 220, Block G, east offset to the discovery oil well for the Seminole structure, showed signs of cleaning itself of drilling fluid within a few days while flowing four barrels of fluid per hour, including 4 per cent BS&W, through one-inch choke from lime at 5027-5060 feet. The gas volume is slightly above 4,000,000 feet daily on choke, indicating that the squeeze job at 4912-5017 feet was not effective. The well shows 1200 pounds casing pressure while flowing through tubing choke. It is bottomed at 1712 feet sub sea, or two feet above the plugged back depth of the offset. Reports credit Shell Petroleum Corporation with planning to acidize the lime to bolster the oil yield.

Amerada Test Checking Low

Amerada Petroleum Corporation's Fasken 1, C NW NW W. T. Section 160, Block G, about 4 1/3 miles southeast of Seminole production, is checking low on structure, based on the top of the anhydrite logged at 2130 feet, or 1153 feet above sea level. It was drilling below 2200 feet late in the week.

In southwestern Gaines County, Blevins, Sloan and Shell Petroleum Corporation Barber 1, NW NE NE Section 19, logged the top of anhydrite at 1580 feet, with an elevation of 3473 feet, and is credited with being slightly higher on structure than failures in the area.

The southeastern Bailey County prospect of Ernest L. Wilson, Illinois Oil Company, et al on the Yellow House Ranch was drilling in brown lime at 4680 feet, with an elevation of 3687 feet, and is checking about normal for structural position of the area. R. S. Bond, L. C. Harrison et al's Wm. Cameron 1, east central Cochran County wildcat, is approaching a decisive level with drilling underway in lime at 4700 feet. Top of Brown lime was called at 3760 feet, or 60 feet below sea level.

Stanolind Gets Block

Stanolind Oil & Gas Company has acquired control of a block of about 1000 acres purchased by McElreath & Suggett adjacent to the east border of The Texas Company et al's discovery block in southwestern Hockley County, and will drill near CSW Labor 76, League 37, Zavalla County lands. The flowing producer on the Slaughter land is shut in for storage.

York & Harper, Inc. Midland, is credited with having contracted to drill a test in northern Gaines County and near the Wasson prospect as part consideration for a lease on Section 379 and the east 320 acres in Section 345, Block G. Location will be assigned to the latter tract.

Additional development work is slated to be started shortly near the new pool opened by Basin Oil Properties, Incorporated on the Herrington tract, Upton County, about 1½ miles north of nearest production in the McCamey District. The well pumped 187 barrels of 24 gravity oil on initial gauge after using 4000 gallons of acid in dolomite at 2815-2825 feet. It has an elevation of 3112 feet.

Possibilities of production extending southwest of Goldsmith field. Ector County, as now outlined by flowing producers and beyond Gulf Oil Corporation's big leasehold is the basis of a moderate lease and royalty play. Shasta Oil Company paid $15 per acre cash and contracted to drill a well for the south 320 acres of Section 32, Block 44, T-1-S, and has made location in the northeast corner of the tract, about two miles west by south of production. Continental Oil Company's Wight 1-A-18, SW Section 18, Block 43, T-1-S, about one mile east of nearest production, is drilling near the 3400-foot level.

Fisher County well completing in new lime

Abilene, Texas.—Development of leases adjacent to the high-gravity oil area uncovered in northwestern Fisher County on May 15 by Southern Oil Corporation of America's Joe Robinson 1, C E½ NW H&TC Section 172, Block 2, is being held up pending the landing of a string of 7-inch pipe for completion in new lime zone for the county at 3502-3505 feet. Sam C. Yingling, president of the company, forecasts an initial yield of about 3000 barrels of 41.7 gravity oil when pipe is run with the aid of pressure-control equipment in order to avoid killing the well, which flowed between 20 and 30 barrels of pipe line oil per hour through leak in gate valve for more than a week after striking the oil pay at a sub-sea depth of 1554 feet. The well was shut in after filling lease tanks and emergency pits. Yingling has announced that the discovery well and approximately 1000 acres of nearby leases will remain identified as above, although other producing properties held by the company in the Royston field, Fisher County, are now operated as National Petroleum Corporation, an affiliated unit.

Tide Water Associated Oil Company holds a direct east offset, while Magnolia Petroleum Company has lease on more than 1000 acres in the immediate area. Tom Largent and H. Abrahason, who worked the surface and subsurface geology for the discovery, and Sam C. Yingling paid $4 to $6 per acre cash and contracted to drill a well for lease on about 1820 acres to the northwest of the new strike, which has been designated the Robinson area.

Exploration of the Ordovician lime horizon to the northeast of the Noodle Creek field, Jones County's original oil field, is due to be made by Humble Oil & Refining Company on a large lease block acquired several years ago for a deep test. Location has been made

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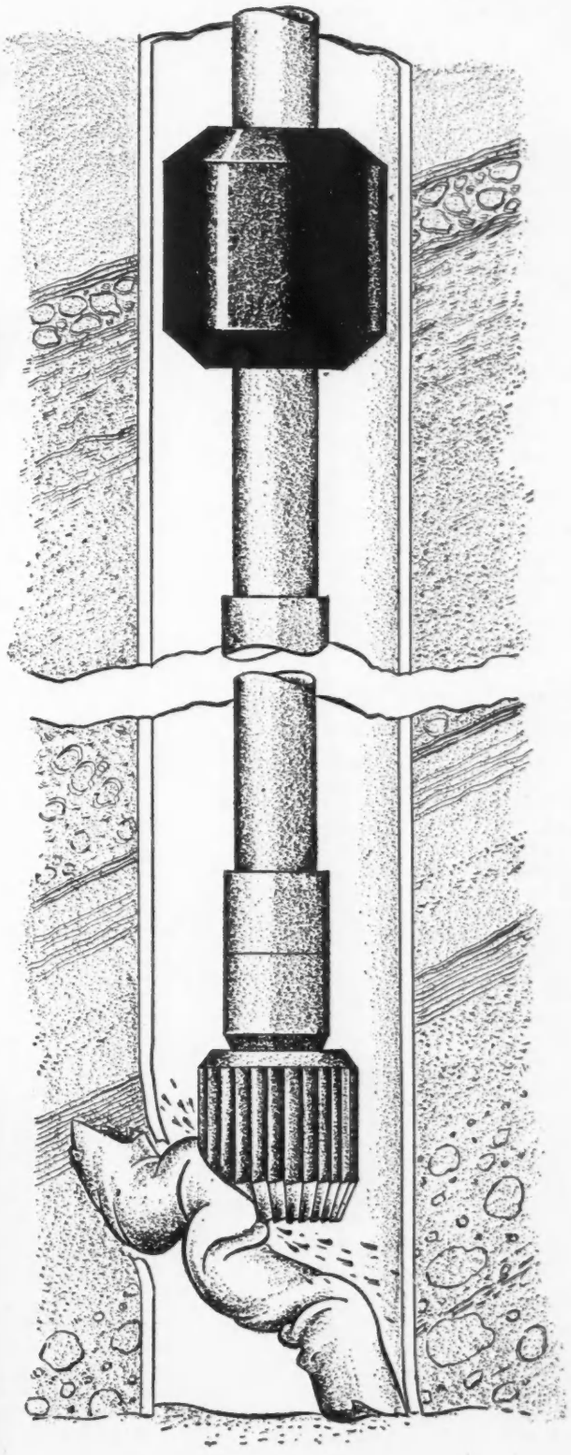

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by the company for J. N. Teaff 1, C SW NE T&T Section 33, Block 18, near the stream responsible for the naming of the above field.

Prospecting near the small oil pumper developed recently in northeastern Taylor County by Dunn and McAllister, Abilene, has extended into northwestern Callahan County. In the latter county, Donald O'Neil and Owen M. Murray, have started operations on J. L. Estes 1, SEc NW TP Section 66, Block 14, 6 miles northeast of the producer and on an 1800-acre block.

Keystone hearing scheduled

Austin.—A hearing has been scheduled by the Texas Railroad Commission for June 7 at Austin to consider the application of the Sinclair Oil & Refining Company for a 10-acre spacing rule in the Keystone field in Winkler County.

The rule now provides for wells located 880 feet apart and 440 feet from lease or boundary lines. This is a well to 18 acres, approximately.

South Vernon well making high-gravity oil

Wichita Falls.—Lower Canyon lime zone in the Rock Crossing section of the South Vernon district, Wilbarger County, yielded its first commercial high-gravity oil producer when McDonald and Campbell's W. T. Waggoner Estate 3-A, NEc H&TC Section 26, Block 4, swabbed 300 barrels initial May 22 after using 3000 gallons of acid solution at 3583 feet, or 2451 feet sub-sea. This well establishes a new producing horizon for the county, and passed up oil saturation in 3 zones below 3043 feet without encountering water in order to explore the lower Canyon, which showed possibilities in a 4090-foot failure drilled slightly more than 1 mile north by east by Empire Oil & Refining Company. The latter holds a direct east offset to the new producer, and contributed dry hole money.

An aggressive drilling and well-deepening program for a narrow strip, extending in a northwest to southeast trend across the Rock Crossing area, preceded this new discovery on the strength of the successful completion of 4 prolific natural producers 2¾ miles northwest of McDonald and Campbell's strike. The 4 wells are bottomed in upper Canyon at about 3076 feet, and are the largest in the county. Dry holes virtually confine the probable Canyon production to an area already held by shallower production, leaving no opportunity for outside interests to acquire protection. Riner, Massie & Fain's W. T. Waggoner Estate 19-A, SE NW Section 22, Block 4, failed to produce in the upper Canyon when deepened to 3081 feet, and has been abandoned.

Clay County Work Revived

Revival of exploration work on the Worsham ranch, Clay County, is destined to follow in the wake of the success of Walter H. Gant et al's C. M. Worsham 3, which is rated at 500 barrels natural from sandy-lime at 3920-3927 feet. The well filled with oil in 12 hours after drilling plugs, and flows 45.8 gravity (corrected) oil by heads when opened. Magnolia Pipe Line Company will provide a pipe line connection.

Gulf Oil Corporation pioneered developments in this area, beginning late in 1922 when C. M. Worsham 1, NWc T&NO, Section 3, 6 miles north of Bellevue, made 250 barrels of 42 gravity oil after nitro shot in upper pay at 3383-3446 feet. Operations were continued through 1925, and several deep failures indicated production possibilities in the 3900-foot zone now proved by Gant et al's well, which is 2700 feet northwest of Gulf Oil Corporation's Worsham 6, which made a small producer with water at 3408 feet. The latter concern abandoned the properties a few years later because of predominance of water. Gant et al control lease on 6500 acres. Magnolia Petroleum Company was credited with paying $25 per acre cash for lease protection the past week.

Grayson County Deep Tests Authorized

Two new deep tests for western Grayson County have been authorized by Denver Producing & Refining Company (Hugh Rapp et al). This concern's J. R. Singleterry 1, about ½ mile southeast of Collinsville, gave the county its first deep oil producer last April 1 in recording an initial of 56 barrels of 27.6 gravity oil from lime at 3862-76 feet after plugging back from 4219 feet to 3880 feet. The discovery well continues to pump its 50 barrel daily allowable. Location for a 6000-foot test has been made on the G. E. McMenamy 60-acre tract, J. Hartzog Survey, A-528, 2 miles southwest of Whitesboro. It is supported by a 5000-acre lease block. Contract has been made for the drilling of a 4000-foot test on the Cannon land, Elizabeth Barnes Survey, A-55, centering upon a 6000-acre block, and 2½ miles northwest of Whitesboro.

In eastern Cooke County, The Texas Company et al's J. F. Marshall 1, A. Burns Survey No. 49, resumed last week after renewing its water supply, and was drilling at the 2000-foot level. Magnolia Petroleum Company and Skelly Oil Company hold an interest in this proposed 6000-foot test, which is located on a geophysical prospect in the Delaware Bend area and on acreage assembled by Samuel S. Alexander, Fort Worth, and others.

Plugging orders were issued early last week for the eastern Montague County wildcat drilled by Selby Oil & Gas Com-

TEXAS PANHANDLE

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
GRAY COUNTY—		
King Oil Co., M. L. Jackson 6	705	3245
Shell, T. B. Haggard 4	581	3300
Southern Pet. & Explo. Co., J. S. Baird 6	663	3256
Stanolind, T. B. Cobb 10-C	165	3329
Texwell Oil Corp., Frazier 1	¶12	3035
HUTCHINSON COUNTY—		
J. H. S. Bonner, Tr., J. W. Moore 2	452	3168
J. R. Phillips et al, W. D. Twichell 1	85	3067
Phillips Pet. Co. (was Stansylvania), Thompson-Lasater 1	548	3261
Skelly, E. E. Watkins 6	552	2935
The Texas Co., J. W. Moore 6	350	3157
MOORE COUNTY—		
Kerlyn Oil Co. (was Anderson-Kerr), M. Bridges 1	¶13.7	3411
Phillips Pet. Co., Clark Gable 1	¶59	3250
Floreida Vaughn 1	¶74.7	3135
Shamrock O&G Corp., L. B. Cox 1	¶98.7	3130
J. T. Sneed 5, Sec. 40	¶35	3130
WHEELER COUNTY—		
Alma Oil Co., Perkins-Cullum 4	¶6.5	2470

*Failures; †Junked; ¶Million cu. ft. gas.

NORTH TEXAS

Completions

Company, Well and Location—	Init. Prod. Bbls.	Depth
ARCHER COUNTY—		
L. T. Burns et al, C. B. Abney 1, sec 1	*	1771
G. F. Martin 1	10	989
Golding & Cochran, H. E. Brown 17, sec 6	21	1182
Luther Hedrick et al, Wm. Coleman 1, sec 74	*	1500
King Oil Co., J. J. Perkins 10, sec 13	38	1001
F. L. Pilkenton et al, E. N. Birdwell 1	2	628
G. J. Scholl et al, Claude Cowan 3, blk 6	*	1170
Sinclair Prairie, Richardson-McLean 4-E, blk 8	*	1350
CLAY COUNTY—		
Bridwell Oil Co., Saner-Lomax 10	18	1119
The Texas Co., Saner-Lomax 3	61	1092
COOKE COUNTY—		
Dove Oil Co., J. A. Carr 9	53	1950
J. A. Carr 11	55	1960
J. A. Carr 13	*	2042
Kingery Bros., H. Henscheid 1-A	20	780
Ripps & Ungerman, W. L. Johnson 7	132	1942
DENTON COUNTY—		
Bolivar Drlg. Co., B. R. Bentley 1	*	2118
Geo. Greer et al, T. M. Ross 1	*	2302
JACK COUNTY—		
Beard & Collier, W. R. T. Ezzell 1-B	260	2968
Carpenter Oil Corp., W. Hanna 1, sec 3318	*	503
Edwards-Knowles & Crespi, Simpson 4	279	3003
Jack Kadane et al, Geo. Everett 1	¶1	3220
J. E. Lake et al, Mrs. T. S. Hedrick 1	*	707
MONTAGUE COUNTY—		
S. F. Lobaugh et al, T. D. Wilson 1	*	1107
N. H. Martin & Son, Mrs. M. Salmon 4	15	1186
Pure Oil Co., W. W. Jones 6-A, blk 38	6	932
Ruble & Lowery, J. E. Lemons 1	*	978
Sinclair Prairie & Gibson-Jennings, Inc., V. Holt 1, blk 56	25	1766
The Texas Co., Cunningham 16-A	79	944
J. F. Lemons 3	57	926
J. E. Lemons 4	46	927
WICHITA COUNTY—		
Cable Oil Co., J. E. Roller 23, sec 4	*	450
J. E. Roller 24	1	276
Culbertson Co., Waggoner Bros. 85, sec 13	*	688
Fresno Oil Co., L. F. Ramming 24	10	1306
L. F. Ramming 25	8	1716
H. G. Mitchell et al, T. F. Mitchell 1, sec 1	*	900
T. F. Mitchell 2, sec 1	*	501
Pois & Schulz, Foster-Allen 5-C	115	1288
Foster-Allen 1-E, sec 2	*	1300
E. J. Stump et al, R. L. Crudup 1, blk 19	*	1830
The Texas Co., Waggoner Est. 435, sec 148	82	1975
WILBARGER COUNTY—		
E. C. Lawson et al, Waggoner Est. 2-H, sec 41	32	1905
Riner & Massie, Waggoner Est. 19-A sec 22	*	3318
WISE COUNTY—		
Texas Canadian Dev. Co., W. D. Nimmo 1	*	3539
YOUNG COUNTY—		
Duncan, Holt & Marchman, Benson 21, sec 1391	185	915
Goding & Cochran, R. T. Kerr 1, sec 173	*	1200
Geo. E. Kesterson et al, Nora Finch 1, sec 38	*	785
Kimmell, Lee & Co., H. O. Prideaux 6	10	673
W. S. Langford et al, V. N. Woolfork 1, sec 13	*	750
Pet. Producers Co., C. E. Luton 10	*	666
Rathke Oil Co., C. E. Graham 16, sec 3401	30	908
E. C. Reed et al, Geo. Brooks 1, sec 1919	*	561
E. Weems 1-B, sec 626	*	625
A. T. Strong et al, W. A. Dennis 1	444	4009
C. D. Thornton et al, C. F. Dailey 3	*	547
Wichita Prod. Co., E. C. Keith 14, sec 267	2	721
White & Duncan, D. E. Logan 1, sec 234	*	1052

*Failures; †Junked; ¶Million cu. ft. gas.

pany, Tulsa, and Lee R. Payne on the J. M. Batts 103-acre tract, M. B. Tatum Survey, after attaining a depth of 5539 feet. No showings were recorded.

WEST TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ANDREWS COUNTY (Fuhrman)—		
Fuhrman Pet. Corp., W. H. Boner 5-B	276	4503
CRANE COUNTY (McCamey)—		
Superior, (Cal.), Hughes 4	735	2265
ECTOR COUNTY (Foster)—		
Broderick & Calvert, H. C. Foster 2	576	4195
Amon G. Carter et al, J. L. Johnson 1	405	4190
ECTOR COUNTY (Goldsmith)—		
Atlantic, Cummins 2-D	288	4255
TP Land Trust 2-A	1158	4260
Landreth Oil Corp., C. Scharbauer 3-D	1300	4231
C. Scharbauer 2-E	264	4229
Shasta Oil Co.-Cordova Union Oil Corp., Cummins	297	4256
ECTOR COUNTY (North Cowden Field)—		
Stanolind, J. M. Cowden 45	787	4290
FISHER COUNTY—		
General Crude Oil Co., B. F. Willingham 9	241	3117
HOWARD COUNTY—		
Ennisbrook Oil Corp., Texas Ld. & Mtg. Co. 14	697	2798
Shell, D. Roberts 3-A	175	3011
W. R. Settles 2-A	519	2475
Stanolind-Lee Pet. Co., TP Land Trust 4	1080	2502
Ward Oil Corp., D. Roberts 26	720	1362
HOWARD COUNTY (Wildcat)—		
Moore Bros. Corp., TP Land Trust 1	213	2900
PECOS COUNTY (Pecos Valley)—		
Kone Prod. Co., Pecos Valley 5	80	1631
PECOS COUNTY (Toborg Field)—		
Phil Broun et al, Tippett-Humble 19	79	479
Cardinal Oil Co., Tippett-California 4-J	20	582
PECOS COUNTY (Yates)—		
Ohio Oil Co., I. G. Yates 39-B	29,952	1434
PECOS COUNTY (Wildcats)—		
Adams & Black, Lehn-Masterson 1	*	1740
E. R. Minshall et al, J. B. Banker 1	*	3005
UPTON COUNTY (Gulf-McElroy Field)—		
Gulf, Crier-McElroy 26	812	2965
UPTON COUNTY (McCamey)—		
Blaine Oil Co., Powell 1	551	2691
British-American O. Prod. Co., Robbins 6	1080	2222
Roy Brown & Goods, A. L. Mayhew 1	*	2053
Brown-Hancock-Hines Oil Co., Baker-Pure 2-A	652	2345
Cardinal Oil Co., E. Wooley-Shell 2-C	420	2147
J. W. Ellis et al, Robbins 5	630	2114
R. W. Fair Oil Co., Cordova Union 3	25	2239
Homestead O&G Co., Hughes-Pure 4-A	951	2745
Republic Prod. Co., Baker 7	313	2235
Rodman & Easter, Hughes-Humble 1	714	2489
Stanolind, A. S. Burleson 43	268	2158
WARD COUNTY—		
Gulf, E. W. Estes 25	2716	2650
E. W. Estes 27	1060	2650
G. W. O'Brien 82	704	2730
Standard Oil Co. (Texas), McFarland 6, sec 37	2316	2645
J. F. York 30	241	2525
Tide Water Associated, W. D. Johnson 21	2764	2665
W. D. Johnson 23	3532	2660
W. D. Johnson 24	1036	2615
W. D. Johnson 25	4061	2675
Tysco Oil Co., W. M. Casey 1	*	2382
WINKLER COUNTY (Halley Field)—		
Sun, S. M. Halley 6	524	2816
WINKLER COUNTY (Kermit)—		
Atlantic-J. C. Maxwell, Lovett 9	1010	3150
Empire O&R Co., Daugherty 7-D	504	3030
Gulf, Daugherty 38	508	3020
Humble, Walton 7-B	195	3100
Illinois Oil Co., Abilene Bank-Conoco 7-A	2013	3110
Abilene Bank-Conoco 15-B	997	3120
Sinclair Prairie, H. E. Cummnis 4-C	262	3035
Siosi Oil Corp., J. C. Lovett 10	817	3120
WINKLER COUNTY (Wildcat) —		
Dunigan Bros.-Brahaney, Sealy 1	*	3210

*Failures; †Junked; ¶Million cu. ft. gas.

EAST TEXAS

Talco outpost test shows for production in Paluxy.

* * *

Anderson County test going below 10,000 feet.

* * *

Four Trinity tests planned in Milam County.

Talco, Texas.—Recovery of 59 feet of oil-saturated Paluxy formation by F. D. Jones et al's A. A. Bassham-Gulf 1, located 1700 feet northeast of nearest production in the Sulphur Bluff field, Hopkins County, forecasts a successful oil completion for this outpost. Top of Paluxy series was logged at 4456 feet, and pay at 4482-4541 feet. The hole is bottomed at 4106 feet subsea, indicating a favorable position above the water table. The fault was cut at 3111 feet, which was also the top of the first Woodbine section. The well was due to make a production test late last week. Correlation of the geological markers of this outpost with nearest producers reveals that some closure has taken place, according to geologists, but the field has possibilities of continuing another mile to the northeast along the Mexia-Talco fault.

The Texas Company's Emma Davis 1, 4 locations west of nearest production in the Sulphur Bluff area, recorded a relatively low structural position in logging top of the Paluxy series at 4499 feet, and was coring ahead. This outpost cut the fault plane at 4000 feet. Shell Petroleum Corporation, owner of the Reynolds 200-acre lease, adjoining on the east, has applied for permits to drill 3 additional tests at 533-foot intervals to the west of its two flowing wells on the north end of the property. Shell Petroleum Corporation's completed wells are making from 10 to 20 percent water while flowing their allowable, and water has also appeared in one of Empire Oil & Refining Company's wells on the J. E. Worsham tract. Other wells in the field are flowing their allowable without making water. Appearance of water in the above wells was anticipated, as they are low on structure and had to be drilled near the water table in order to develop flowing production.

Only Two Paluxy Fields

Sulphur Bluff and Talco fields are the only areas in Texas that yield commercial production from the Paluxy, or upper Trinity, and both are on the same fault trend. The former is comparatively small in productive area, but is more prolific and has recorded 43 completions without a failure, except for a test 7000 feet southwest of production. Recovery per acre at Sulphur Bluff is expected to average from 25,000 to 30,000 barrels. Talco field embraces a much greater area, and is subject to additional extensions to the west and along the south edge, but is subject to rapid encroachment of water in nearly all areas, regardless of the structural position of the wells.

Faulted structure, centering 5½ miles southwest of the Sulphur Bluff field, is to be tested for Paluxy production by Housh & Thompson, Inc., co-discoverer of the Talco field, E. L. Ashcroft and Bob Nelson. Location is in the southeast corner of the Spencer 92-acre tract, G. Lincecum Survey, on an echelon fault. Previously drilled Woodbine failures provide accurate subsurface control for the area.

Operations were halted late last week on Mrs. S. O. Thompson, H. H. Jaffe's R. Rosemond 1, near SEc 425¼-acre lease, Jeff Milam Survey, 3 miles southwest of Red Water, Bowie County, after completing depth contract at 6008 feet, with the hole bottomed in lower Glen Rose. Massive anhydrite was logged at 5463-5698 feet, and top of the Hill sand at 5759 feet, with an elevation of 285 feet. Negotiations are pending for adjacent lease owners to take over the prospect and continue to the Travis Peak.

Stanolind Oil & Gas Company's Hawks 1, lower Trinity prospect for the Campbell faulted structure, Hunt County, logged first Glen Rose at 4819 feet, with an elevation of 566 feet, and was drilling at 5420 feet. Humble Oil & Refining Company's L. K. Riggs 1-A, deep test for the northeast flank of the Van field, was drilling in chalk at 3020 feet, having skidded rig from junked hole in Paluxy at 4664 feet.

First 10,000-foot hole in East Texas

Palestine.—First 10,000-foot hole for the East Texas basin was scheduled to be attained late last week in the Long Lake field, Anderson County. Tide Water Associated Oil Company and Seaboard Oil Corporation's Monnig 7 set the above level as its goal after electrical formation surveying instrument used at 9971

feet revealed that the Travis Peak member of the Lower Trinity topped at 9930 feet, with an elevation of 233 feet, was void of oil or gas. This is the first deep test for the field, and only minor showings of gas and distillate were recorded in the Lower Glen Rose section, topped at 8748 feet.

Roeser & Pendleton, Inc.'s Bowyer 3, third Trinity test for the Cayuga field, Anderson County, logged first anhydrite stringer at 7113 feet, with an elevation of 317 feet. Location is on the west flank of the structure.

Barnett Petroleum Corporation has contracted to drill the previously-announced Trinity prospect undertaken by John G. Mayo et al on the east portion of the Mount Enterprise faulted structure, Rusk county. Location is on Garrison-J. C. Sanford 161-acre tract, W. A. Corder survey, 1½ miles southeast of Caledonia.

Steady flow of mineral water was developed from the Lower Glen Rose by J. Edward Mill et al's Sam Grucholski 1, Falls County wildcat, and 5 miles southwest of Kosse, following gun-perforation of 5 3/16-inch casing at 5284½-88½ feet. The hole had been plugged back from 5526 feet after cementing pipe at 5374 feet. Perforations will be cemented, and additional ones made at 5254-70 feet, opposite Oolitic lime.

Four lower Trinity tests for an equal number of drilling blocks in northeastern Milam County have been contracted for by Kingdorr Exploration Company, Houston, and Philtop Oil & Gas Company, Dallas. An aggregate of about 30,000 acres has been leased extending along the Balcones Fault about 200 miles south from the north line of the county and bounded on the east by the Brazos River. Operations have been started on the first test, located 660 feet from the south and 990 feet from the west line of the J. M. White 160-acre tract, Byrum Wickson survey. J. G. Hammond Drilling Company has the contract to drill this test to 5200 feet.

State to take bids on Rusk County lands

Austin.—The State Board for leasing Eleemosynary lands has announced that bids will be received on June 24, in Austin on the Rusk penitentiary lands in Cherokee County.

Two tracts totaling 955 acres are offered, both being located in the William Bartee survey. One tract includes 285 acres and the other 671 acres. Each tract is to be leased as a unit. The land is located west of the town of Rusk.

462 Texas permits

Austin.—The Texas Railroad Commission approved last week permits for drilling 462 new wells in Texas, 43 less than were allowed the week before.

In the East Texas field there were 98 new locations, including 48 in Gregg County, 38 in Rusk County, 11 in Upshur County, and one in Smith County. The East Central Texas district reported 38 scattered locations.

West Texas reported 97 permits with 32 in Upton County, 21 in Ector County, 14 in Ward County, and 17 in Winkler County. The Panhandle area reported 17 permits.

There were 93 locations from the North Texas district with 27 in Jack County, 17 in Wichita County, 15 in Young County, and 12 in Archer County. West Central Texas listed 18 locations.

There were 68 permits for wells in the Gulf Coast district including 19 in Nueces County and 10 in Brazoria County. Southwest Texas reported 41 permits of which there were 14 for wells in Webb County.

Tom O'Connor hearing June 8

Austin.—Hearing on the Tom O'Connor field, Refugio County, has been set for June 8 at Austin by the Texas Railroad Commission. At this hearing the Commission will consider rules for spacing, drilling, completion, and operation of wells in this field.

Last Thursday the commission issued an emergency spacing rule for the field providing for one well to 20 acres. Under this regulation, which is to remain in effect for 15 days only, wells must be located 466 feet from property lines and 933 feet apart.

"Provided, however, any well shall be permitted to be drilled at a distance of not less than eight hundred (800) feet from any drilling or completed well, if such well be drilled on a unit of not less than twenty (20) acres."

Plan regulation of drilling muds at Corpus

Austin. — Commission officials indicated at a hearing last week that they planned to provide uniform rules regulating drilling muds to be used in the Saxet and Corpus Christi areas. While they recognized the difficulty in promulgating a rule that would apply to the variable depths and variable pressures encountered in this area, engineers expressed the opinion that such a regulation was practical and should be provided.

At the same hearing one group of operators protested that its allowable was too low on large leases with few wells which are offset by many small tracts where a large number of wells are concentrated. They sought an order from the Commission that would permit greater consideration for the acreage factor.

Drilling contractors restore discontinued association

Dallas. — Restoration of the Texas-Louisiana-New Mexico Drilling Contractors Association as an active body won the approval of contractors at a meeting held here May 24. The organization, formed in 1933 primarily for the enforcement of the NIRA, was discontinued when the act was rendered void.

Mike J. Delaney, Dallas, has been reelected president along with other former officers. He was head of the association during the entire time that it remained in operation. Other reinstated officers follow: E. A. Showers, Houston; and George Barham, Shreveport, vice-presidents; and W. D. McBee, Dallas, secretary-treasurer.

Announcement was made that a full-time executive secretary will be engaged.

EAST TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
JOINER AREA—		
Bert Aston & Greenway, J. Alford 12 (46.45-ac)	5000	3718
R. W. Fair & Thompson, E. B. Alford 2 (10.8-ac)	2000	3595
W. H. Gant-Garvin-Wegener, L. E. Edwards 7 (52½-ac)	1000	3600
Gulf, W. L. Murphy 13 (79.56-ac)	9100	3768
Humble, Sol Dennis 10 (73.15-ac)	8700	3751
Sol Dennis 11 (73.15-ac)	9000	3759
T. A. Johnston, Tr., J. H. Stewart 2 (7½-ac)	1500	3730
M. H. McMurrey, Tr., G. A. Turner 22 (199-ac)	3000	3797
Pine Pet. Co., Giles 8 (30.44-ac)	7200	3727
Sinclair Prairie, G. Patterson 15 (164.33-ac)	4800	3685
KILGORE AREA—		
J. S. Abercrombie-Harrison Oil Co., M. A. Cantrell 17 (56.11-ac)	9300	3671
Amerada, C. Jenkins 6 (50-ac)	3000	3521
Atlantic, W. J. Brightwell 22 (96.4-ac)	7800	3695
Empire, E. L. Walker 11 (152-ac)	2500	3676
Gulf, S. Hilburn 95 (274.32-ac)	600	3524
Humble, W. D. Peterson 17 (97¾-ac)	450	3615
Iowa-Payne Oil Co., John Elder 3 (10-ac)	9000	3570
Alex McCutchin et al, Elder Bros. 5 (20-ac)	75	3610
Shell, J. H. Spivey 14 (102.45-ac)	8400	3714
Sun-Seaboard Oil Corp., Ed Smith 11 (57.31-ac)	8700	3619
LONGVIEW AREA—		
Arkansas Fuel Oil Co., Burnside 44 (209-ac)	11,000	3574
Atlantic, J. E. Sheffield 8 (49.06-ac)	6000	3650
Fain-McGaha Oil Corp., A. Tooke 16 (100-ac)	9500	3609
E. A. Gosewesch & Hauch (was R. H. Currie), E. H. Hamilton 1 (70-ac)	750	3717
W. R. & H. A. Jones, D. C. Satterwhite 4 (13½-ac)	8800	3711
Magnolia, T. W. Tuttle 9 (54.66-ac)	10,600	3530
Mudge Oil Co., J. W. Free 16-A (104.6-ac)	7700	3690
P. H. Pewitt et al, L. A. Williford 9 (133-ac)	750	3689
B. F. Phillips et al, H. Douphrate 2 (10-ac)	750	3753
L. J. Everetts 1 (80-ac)	900	3638
B. H. Rogers et al, J. Evers 5 (44-ac)	100	3843
Rudco O&G Co., W. R. Nicholson 1 (113½-ac)	600	3697
Shell, G. Jones 10 (43.52-ac)	9000	3585
Stanolind, F. K. Lathrop 26-B (63.68-ac)	1500	3620
Stanolind-Conoco-Tide Water, Flewellen 27-C (200-ac)	1200	3775
Sun, Crosby-Williams 3 (650-ac)	*	3691
J. K. Wadley et al, W. E. Witcher 1 (40-ac)	100	3750
ANDERSON COUNTY (Cayuga)—		
Tide Water Associated-Seaboard Oil Corp., Wills 7-B (377.1-ac)	500	4089
ANDERSON COUNTY (Long Lake)—		
Hunt Oil Co., W. A. Cartmel 1 (143.68-ac)	2400	5344
FRANKLIN COUNTY (Talco)—		
W. B. Hinton et al, A. Owings 2 (40¾-ac)	230	4351
W. F. Nenny et al, Methodist Church 1 (3.12-ac)	300	4335
HOPKINS COUNTY (Sulphur Bluff)		
D. S. Hager-W. P. Luse-Russ Pet. Co., Pierce 2 (97-ac)	1080	4543
TITUS COUNTY (Talco)—		
Adams & Lyles, Inc., Pat Davis 2 (41.7-ac)	425	4319
Pat Davis 6 (41.7-ac)	477	4340
B. G. Byars et al, W. T. Edwards 1-B	285	4300
Byrd-Frost, Inc., et al, C. M. Carr-Gulf 2 (102-ac)	250	4278
W. B. Hinton et al, M. B. Coker 3 (75-ac)	606	4245
Humble, A. P. King 38 (1053.36-ac)	304	4314
Monnig Dry Goods Co. 8 (114.4-ac)	49	4305
Pan-American Life Ins. Co. 3 (80-ac)	310	4301
Magnolia, Mary Batson 2 (30-ac)	750	4310
J. S. Rushing et al, C. T. Mitchener 6 (37.2-ac)	412	4258
Tide Water Associated, C. M. Carr 7 (75.37-ac)	120	4315
HOUSTON COUNTY—		
Placid Oil Co.-Shell Pet. Corp., J. E. Elliott 1 (200-ac)	25	6634

*Failures; †Junked; ¶Million cu. ft. gas.

New Catahoula sand field found in Nueces County.

* * *

Lamar prospect wildcat makes poor showing on test.

* * *

Wildcat may extend Sandia production one mile east.

Corpus Christi.—Seaboard Oil Corporation has uncovered another oil field for Nueces County in the Catahoula, but is drilling ahead to Frio sands in search of larger production. The well, James P. Luby 1, seven miles southwest of London, cored sand section from 4319-39 feet, and on two drill stem tests showed sufficiently to indicate commercial production. The test will be carried to its 7000-foot contract, and if no other shows are encountered, it will plug back and complete in the Catahoula.

Several other wildcats are being drilled in Nueces County but none have encountered anything encouraging. United Production Corporation's Harvey 1, attempting to open 7300-foot sand west of the Agua Dulce field, has been recemented and is ready to retest. It showed a large volume of salt water and gas with some oil in this sand, either at the base of the Frio or top of the Vicksburg.

Test Near Sandia Showing

Over in Jim Wells County, Smith Drilling Companys' W. D. Wade 1 is showing for a producer in the upper Jackson at 5130 feet, where a drill stem test developed 273 feet of mud, oil and gasoline under 300 pounds pressure in 10 minutes. The well was drilled ahead to just below 5700 feet, where it attempted to blowout. Efforts are being made to set casing below the 5100-foot sand to protect the hole and allow deepening to Cockfield sand around 5800 feet. This test is one mile east of the Sandia field production and is 750 feet northwest of a test drilled by Simms Oil Company.

Barnsdall Oil Company's Kate Edwards 1-A, Lamar prospect, Aransas County, drilled to 8029 feet and ran a drill stem test from 7545 feet to the total depth, using a 3000-foot water cushion. It showed only a small amount of gas during the 20 minute period the tool was opened. The hole was reamed to 8010 feet, drill stem test being made of the remaining 19 feet of open hole. It recovered 3200 feet of salt water, using a 3000-foot water cushion. The test is now coring ahead. Edwards 1-A is one location southwest of Edwards 1, which recently blew out at 7997 feet.

Heyser field, Calhoun County, was defined on the east by Portilla Drilling Company's P. H. Welder 8, which was abandoned at 5513 feet.

Over in Jackson County, The Texas Company's Hultquest 1, east offset to the discovery well of Ganado field, was waiting on cement after setting casing at 5150 feet. It showed 7 feet of sand at 5103-10 feet, where a drill stem test of 10 minute duration developed 650 feet of oil, mud and salt water.

United Production Corporation was reported to be drilling plugs in J. J. O'Brien 12, deep test in Refugio field, Refugio County. The well had been drilled to 8357 feet and was reported to have encountered a sand section between 60 and 85 feet in thickness around 8000 feet. A string of 7-inch casing was set on bottom. It is understood that the well will drill ahead and test lower sands.

Drilling results increase importance of Sweden

San Diego.—New extensions to the Sweden district, eastern Duval County, further increase the importance of this recently discovered reserve. Russ Petroleum Corporation et al's A. Faris 1, a half mile northwest of the discovery well, flowed 92.78 barrels of oil in 18 hours through ⅛-inch choke under a casing pressure of 780 pounds and a tubing pressure of 700 pounds. The well was in sand at 4795-4804 feet, elevation 412 feet, making the test 17 feet structurally lower than the discovery.

Still farther north, about 1000 feet, Parr Oil Company's F. Vaello Puig 1, cored the sand at 4795½-4800 feet and showed for a producer on drill stem test. It is drilling plugs. Just south of the discovery test, Benedum and Trees' Puig 1, is cleaning into pits at 4743-52 feet. One-third mile to the west, Reynosa Oil Company's Wilson was coring for the sand near 4750 feet.

Developing New Sand

In the original Sweden field, several miles to the south, a new 5100-foot sand is being developed. Hiawatha Oil & Gas Company's Southland Life 2, northwest of the pool, made a gasser through perforations at 5100-5 feet and is being reworked. George Herberger 2 is setting screen for recompletion after perforating at 5080-84 feet. It first started flowing oil and gas, but sanded up, necessitating the reworking.

Several miles south of the field, George V. Viteri et al's E. E. Cadena 1 is holding considerable interest as it cores ahead below 4650 feet. The well topped Frio at 4236 feet, Jackson at 4583 feet and is to drill to 7000 feet. It showed a little oil at 4249-53 feet.

Thomas and Lockhart were preparing to make a production test in Parr 2, north offset to the discovery well of the Thomas-Lockhart field, also in Duval County. The well drilled to 4904 feet, but plugged back to set casing at 4680 feet. It is in sand at 4677-4704 feet.

Edwin M. Jones' Harry Ezzell 4, wildcat three miles west of Simmons City, but in McMullen County, was preparing to run casing May 28 after a drill stem test of Loma Novia sand at 1525-34 feet developed 750 feet of pipe line oil in 15 minutes. The well opens a new oil field for South Texas and is 25 miles northeast of the nearest production in this sand.

The above well, located NW SE SE Section 20, Ezzell Ranch subdivision, Section 20, H. Russell Survey No. 12, is one mile south of the Nueces River and about two miles south of two Government Wells sand gas producers recently completed by Jones to open the Ezzell Ranch field. He has approximately 15,000 acres under lease in a solid block, thus controlling the major part of this structure.

Hot lease play follows strike in Edwards lime

San Antonio.—Lease deals involving many thousands of acres are the immediate follow-up to the new Batesville field, Zavalla County, discovery in the Edwards limestone. Both major and independent operators figure in the transactions which may lead to the immediate exploration of this apparently prolific new South Texas field.

H. F. Wilcox's T. J. Gilliam 1, Section 11, discovery well of the field, was waiting on storage for production tests. The well, apparently in Edwards limestone at 3941-47 feet, flowed at the rate of nearly 200 barrels per hour open for 1½ hours, but was shut in until additional facilities could be provided.

Magnolia Gets Block

Magnolia Petroleum Company figured in as the largest lease purchaser in the district. It is reported to have paid $5.00 per acre for ½-interest in slightly more than 3600 acres of the 4850-acre A. A. Storey ranch which reaches to within less than two miles east of the new producer. The remainder of the ownership is reported to be in litigation and several offers for this portion are said to have been made during the week. The company bought the 2712-acre and 1000-acre Charles Brown leases, commencing two miles south and southwest of the discovery well, paying a reported price of $20.00 per acre. The company also purchased 1343 acres of the G. S. Houston land, about four miles southwest of the discovery well and southeast of Batesville. These tracts previously had been taken

from the landowner by the Holland Oil Company.

Benedum and Trees Oil Company paid a reported $20.00 per acre cash and a gross $200,000 oil payment for 3281.5 acres lease out of the Webb and Brown Ranch, commencing two miles southwest of the discovery.

Top Price $175.00 Per Acre

Wray Richards paid the largest single sum per acre, being $50.00 in cash and $125.00 in oil for 40 acres slightly more than 1½ miles southwest of the discovery. The tract was out of the Webb and Brown Ranch.

Holland Oil Company acquired leases under G. S. Houston, William Cassin, W. H. Wilson, Thomas B. Phinezy, and several smaller tracts, ranging from two to 20 miles from the new producer. In these purchases, the Holland concern added nearly 7000 acres to its holdings. These are in addition to the purchases which were turned to the Magnolia. A rather heavy leasing campaign has been underway in the small tract area in the vicinity of Batesville, while the several large ranches in the general vicinity of the new well, not yet leased, are subject to present trading.

Humble Oil & Refining Company was well fortified with acreage in the general area before the well was drilled, completely surrounding the Wilcox block on the northwest, north and northeast with its Kincaid and Mundine & Vaham Ranch holdings, involving tens of thousands of acres.

Deepest in South Texas

Amerada Petroleum Corporation was drilling near 10,100 feet in sandy lime in Halff & Oppenheimer 8, second well in Pearsal field, Frio County, to go below 10,000 feet. It is now the deepest well ever drilled in South Texas, the last record well being Halff & Oppenheimer 2, which went to 10,050 feet. The new test is an attempt to develop Trinity sand production. It may go to 11,000 feet. Just north of the field, Halff & Oppenheimer 1 drilled to 6341 feet in the lime, plugged back, and will perforate in the top part of the Edwards limestone. D. D. Harrigan 1, 2½ miles southwest of the field, was making new hole at 4000 feet.

Several other important wildcats are drilling in the southwestern portion of the Balcones district. In Wilson County, Maryland Oil Company was below 3750 feet in C. N. Tremmell 1, just northwest of Pandora. In southeastern Dimmitt County, Wilcox Oil & Gas Company's Light Ranch 1 was drilling ahead at 6125 feet.

Start construction on outlet for Cole-O'Hern

San Antonio.—Construction has been commenced on a 33-mile four-inch pipe lime from Cole-O'Hern field in Webb County, to Government Wells field, Duval County, where it will be connected into Crude Oil Pipe Line Company's trunk system to Corpus Christi. A pump station will be built at the O'Hern end of the line.

The project is for the O'Hern Pipe Line Company, of which E. L. Buckley is trustee. The concern will be affiliated with the Crude Oil Companies, also Buckley interests.

Barbacoas well to perforate for test of Cockfield

Mission.—Casing has been set to 5417 feet, bottom of the hole, in K. E. Merren's Starr County Cattle Company 1-A, Cockfield sand test in the Barbacoas field of Starr County. The well is showing a heavy gas pressure and the pipe was set to prevent a blowout. Testing will be through gun perforations. The well, cored from 5358-5417 feet, recovering a small portion of the section. What was recovered, however, included hard shale streaks with hard fine tight sand, all carrying oil odor and lots of gas. Several wells have been drilled to the Cockfield in the field, but none has been successfully completed due to high gas pressure.

Two new locations are reported in La Blanca field of eastern Hidalgo County which will bring about the drilling of 8000-foot tests. Shallow and Davenport's Swallow 1 is moving in as a southeast offset to the Macdougal producer, while Atlantic Refining Company is reported to have staked a tentative location to the south of the same well.

9900 Feet Deep at La Sal Viejo

Farther north and on La Sal Viejo prospect in Willacy County, Shell Petroleum Corporation had progressed to below 9900 feet in Yturria 1. It is the deepest well ever drilled in the Rio Grande Valley sector of South Texas and is less than 200 feet from the record depth for all operations in this general territory.

Contracts were let for Ruiz-Morton, Incorporated's, three deep wells projected in Willacy and Cameron Counties. Two previously announced locations in the Willacy area are expected to be started shortly, while United 1, lot 7, block 402, El Jardin subdivision, south of Brownsville, is ready to spud in. The latter well is projected to 7500 feet. Saxet Production Company's Port Isabel 1 is waiting on rig for an 8000-foot test, and Stapper Petroleum Corporation's Port Isabel 1 is drilling near 7850 feet.

The 3000-foot horizon in the Alta Mesa field, Brooks County was extended about ¾ miles to the north by Standard Oil Company of Texas' Mestina 6, which made a flowing well from sand at 2992-3002 feet, casing being set at 2986 feet. The well has not yet been gauged. The discovery well of the field originally was completed in this sand, but later plugged back to open the main 2400-foot horizon. It is the only other test ever to produce at this level.

Barnsdall's Placedo line is nearing completion

Corpus Christi.—Barnsdall Oil Company's new pipe line to Corpus Christi from Placedo field, Victoria County, was nearing completion with the crossing of the ship channel. The project involves 65 miles of pipe and will give the field its first complete outlet to deep water.

The line was pulled across the water of the channel on pontoons and lowered into a ditch, 45 feet below mean low tide and 13 feet below the bottom of the channel. The crossing was negotiated in less than four hours. The pipe is protected from the salt water, being placed inside an eight-inch pipe, which was primed with two coats of enamel, wrapped with felt, on which another coat of enamel was applied, and then wrapped with roofing paper. Lugs welded on the six-inch line hold it centered inside the eight-inch pipe with the angular space being filled with a petrolatum compound.

Request Calliham rules

Austin.—Rules to protect wells from blowouts in the Calliham field, McMullen County were requested at a hearing before the Texas Railroad Commission last week. E. C. Rach, petroleum engineer for E. M. Jones Oil Company, said that they had found efficient operating practice required 150 feet of surface casing with at least 100 sacks of cement.

SOUTH TEXAS Completions

Company, Well, and Location—	Init Prod. Bbls.	Depth
SAN ANTONIO DISTRICT		
BEXAR COUNTY—		
Woodward & Hardie, R. W. Devilbiss 1, John W. Devilbiss sur....	*	2284
Woodward, Hardie & Herrald, Herman Sons 1, Henry Pace League sur No. 37, tr 9 Swearingen, Cassin & Tayloe sub	*	1720
CALDWELL COUNTY—		
Kay Oil Co., N. L. Dunlap Est. 1, Solomon Seal sur (Dunlap).....	150	2146
Lanning & Coffield, C. B. Corder 1, J. A. Neill sur (Branyon).....	715	2199
Mee, Ames & Mee, M. E. Lancaster 4, Dillard Cooper sur (Branyon)..	52	2191
Sherman Nelson, F. M. Branyon 2, Dillard Cooper sur (Branyon)....	425	2138
A. B. Etheridge 1, Thad Hunter sur, (Luling)	15	2180
Taylor Ref. Co., Daisy Hughes 1 R. Revill sur (Luling)	*	2705
J. Patton 1, J. R. Miller sur (Branyon)	15	2227
GUADALUPE COUNTY—		
Riddle Oil Co., E. Nolte et al 2, John Sowell sur (Nolte)	*	1955
Saxet Prod. Co., Grimm Estate 4, Green DeWitt sur (South Darst Creek)	200	2660
V. G. Schimmel et al, Schneider 1, 100-ac tr Jesus Cantu sur.....	*	2132
KENDALL COUNTY—		
Claud Smith, J. M. Gerfers 1, Mark Hodgson sur	*	1076
LAREDO DISTRICT		
DUVAL COUNTY—		
A. J. Brinkoeter, P. Garza de Rodriguez 2, sur 212 (Seven Sisters)..	75	2665
Humble, Dowdy-Fee 17, sur 272 (Seven Sisters)	775	2566
Violet Kohler 59-A, sur 399 (N. Kohler)	*	3535
Roos Brothers 1, 1650 ft sl 330 ft el, sur 119 (Labbe)	250	2871
Magnolia, Servando Benavides 27, blk 31 (Cole-O'Hern)	450	2830
Duval County Ranch Co. 3, sec 203 (Piedra Lumbre)	60	1965
J. O. Wilson 19, sur 248 (Gov't. Wells)	20	2435
John J. O'Hern, S. Benavides 4-C, blk 24 (Cole-O'Hern)	500	2867
Russ Pet. Co. (Highland Oil Co.), A. Faris 1, 330 ft sl & el of ne¼ of sec 9, Sweden subd, Santos Flores Gr. (N. Sweden)	410	4804
Texas Co., Bishop Cattle Co. 26, sur 57 (Loma Novia)	144	2574
JIM HOGG COUNTY—		
Nordan & Morris, W. H. & R. T. Badger 1, sur 640	*	2610
McMULLEN COUNTY—		
De-Sel Oil Co., Lucy M. Claunch 1, 400 ft sl & el of se 40-ac of 200-ac tr in M. Hely sur (S. Calliham)..	*	1292
Humble, H. C. Edrington 4, sur 65	*	3115
Edwin M. Jones, Harry Ezzell 3, 330 ft out of ne cor. se¼ of sec 3, Ezzell Ranch sub, Thos Adams sur (Ezzell Ranch)	¶10	5301
Loma Oil Co., L. Jacob Corp. 7-B, G. H. H. Sur No. 15 (N. Jacobs)	*	1050
STARR COUNTY—		
G. E. Dodd, Trustee, Ben D. Wood 2, Por 84 (S. Ricaby)	†	1725
Moss & Heard, S. B. Ricaby 2, por 83 J of Camargo (Ricaby).....	*	2011

Company, Well and Location	Init. Prod. Bbls.	Depth
WEBB COUNTY—		
Glen Harroun, A. Lopez 3-A, sur 110 (Lopez)	400	2261
Kepley Prod. Co., W. C. Billings 1, sur 6 (Lopez)	*	2303
Magnolia, Brennan-Benavides 42, blk 12, Myrtle E. Hale subd (Cole-B unit)	365	3430
ZAPATA COUNTY—		
Lewis Prod. Co., Martinez 1, center blk 123, McCullough subd, sh 1 El Grullo Gr	*	2259
Lundell Prod. Corp., I. Ramirez 1, 41 ft nel 330 ft sel blk 25 Chittenden sub, sh 1, por 18	*	2508
Magnolia, Gonzales-Cuellar 5, Cerrito Blanco Gr (Cuellar)	*	1313
Matthews Dr. Co., Justina Garcia et al 13, sh 3 Fansler part, Comitas Gr (Escobas)	*	2156
Nordan & Morris, C. Bustamante 18, sh 33 Fansler part, Comitas Gr (Escobas)	27	1211
P. de Los Santos 6, sh 6 Fansler part, Comitas Gr (Escobas)	*	Icn.
Texas Co., Whitehead 99, Cerrito Blanco Gr (Escobas)	*	1472
CORPUS CHRISTI DISTRICT		
ARANSAS COUNTY—		
Buckingham Oil Co. & E. M. Jones, McCampbell Ranch 3-B, sec 40, McCampbell Ranch subd (McCampbell)	750	6552
BEE COUNTY—		
Lonnie Glasscock, I. B. Ablinger 1, John Ryan sur (Beeville)	†	5945
CALHOUN COUNTY—		
Humble & Plymouth, P. H. Welder 14-A, J. M. Rios sur (Heyser)	1000	5480
Portilla Drilling Co., P. H. Welder 8, D. D. Palmer sur (Heyser)	*	5513
HIDALGO COUNTY—		
Ralph E. Fair, Daniel Flores 4, sh 250, por 38, J. of Reynosa (Samfordyce)	585	2977
LIVE OAK COUNTY—		
Ohio Fuel Supply Co., H. F. Rosebrook 2, Louis Romaro sur (Oakville)	†	2740
Sam Wilson, Jr., Southwestern Life Ins. Co. 1, sec 57	*	4605
NUECES COUNTY—		
Cosner & Cosner, Myrtle L. Stockton 2, sec 25 (London)	¶5 & 135	4905
Donico Prod. Co., V. M. Donnigan 4, sec 7 (Saxet)	990	4910
Genro Drlg. Co., Owens 1, blk "D" Harborview Add. (Saxet Heights)	166	4084
H. H. Hoffman, Beck 1, Ellendale Garden No. 2 (Saxet Heights)	300	4122
H. H. Howell, W. S. Hutchins 4, sur 416	500	7505
Pan American Prod. Corp., Rand Morgan 6-D, sur 405, B. S. & F. (Saxet)	450	6908
Port O & G Co., Cox & Cryer 3, Ward & Gallagher sur No. 316 (Saxet Heights)	*	4571
Potter & Snowden, Inc., Anton Kocurek 3, John Smith sur No. 25 (Saxet)	160	4220
Southern Minerals Corp., Frank E. Bliss 20, sur 406, J. W. Stevans (Saxet)	520	6728
Taylor Ref. Co., F. H. Kaler 2, Villareal sur (Saxet Heights)	60	5146
Texon Dr. Co., Anton Kocurek 6, J. R. Wood No. 6 sur (Saxet)	690	4438
REFUGIO COUNTY—		
Hewitt & Dougherty, M. F. Lambert 46, J. M. Swisher sur (Tomoconnor)	2250	5903
Illinois Pet Co., Ira Heard 4, M. J. Ximines sur (Tomoconnor)	1526	5930
Quintana Pet. Corp., W. J. Heard 6, T. H. Webb sur (Tomoconnor)	2650	5925
Tom O'Connor 15-C, blk 51, J. M. Swisher sur (Tomoconnor)	1800	5984
United Prod. Co., M. F. Lambert 47, J. M. Swisher sur (Tomoconnor)	1300	5919
M. F. Lambert 49, Swisher sur (Tomoconnor)	1320	5915
SAN PATRICIO COUNTY—		
Heep Oil Corp., E. H. Welder 7-F, R. Montgomery sur (Plymouth)	*	5674
Plymouth Oil Co., E. H. Welder 74-C, sec 71, Welder Ranch subd (Plymouth)	740	5477
E. H. Welder 75-C, sec 70 (Plymouth)	720	5475
VICTORIA COUNTY—		
Barnsdall & American Liberty, Pickering & Roos 16, S. A. & M. G. sur No. 6 (Placedo)	660	4776
Shell, Houston Nat'l. Bank 4, S. A. & M. G. sur (Placedo)	720	4770
Superior O & G Co. et al. J. Hosek 8, S. A. & M. G. sur (Placedo)	575	4771
Westgate-Greenland Oil Co., F. E. Mikeska 6, J. M. Brownson sur (Placedo)	575	4779

*Failures; †Junked; ¶Million cu. ft. gas.

TEXAS GULF COAST

Segno outpost test discovers new Cockfield sand.

* * *

Frio gas sand is found in Cheek prospect wildcat.

* * *

Sandy Point outpost test is making distillate.

Houston.—A new producing sand at 5340-42 feet was discovered May 27 at Segno, Polk County, by Humble Oil & Refining Company's Kirby Lumber Company B-3, over a mile southeast of production. The new sand is described as lower Cockfield.

After setting five-inch casing at 5330 feet a production test without screen showed 21 barrels of 37 gravity pipe line oil per hour through a quarter-inch choke, with a tubing pressure of 550 pounds. After Kirby Lumber Company 3-B flowed pipe line oil for several days it was killed. The company will set screen and liner.

Kirby Lumber Company B-3 logged gas sand from 5315 to 5329 feet. A drill stem test from 5310 to 5342 feet showed 1700 feet of pipe line oil in 12 minutes through a quarter-inch choke. The well logged the top of the Hockleyensis at 4547 feet and the Cockfield at 5263 feet. Elevation is 152 feet.

Sand Below Regular Horizon

In Segno field proper, J. K. Dorrance's Wing 4, I. & G. N. 15, logged sand showing oil below the regular producing horizon at 5243 to 5247 feet and set seven-inch casing at 5247 feet for a production test. The regular Segno pay was encountered in Wing 4 at 5178 to 5194 feet. Wing 4 topped Hockleyensis at 4554 feet and Cockfield around 5095 feet. Elevation is 149 feet.

La Quinta Oil Compay completed Wing 2 last week, being the second well for the operators at Segno. The well came in flowing 20 barrels per hour through a quarter-inch choke, with a tubing pressure of 600 pounds and a casing pressure of 500 pounds from Cockfield sands at 5194 feet. Sand was logged from 5176 to 5194 feet.

Rajo Oil Company and J. K. Dorrance each completed an oil well at Segno last week. The former's Wing 1 made 145 barrels daily at 5198 feet and latter company's Wing 1 made 434 barrels daily through a quarter-inch choke from 5195 feet.

Silsbee Extended West

Silsbee field, Hardin County, was extended one location west when Republic Production Company brought in Brooks 15, C. G. Brooks Survey, as the best well yet completed in the field. Brooks 15 made 1093 barrels of pipe line oil daily through a quarter-inch choke, with a tubing pressure of 325 pounds and a casing pressure of 800 pounds from Cockfield formation at 6965 feet. Sand showing oil was encountered at 6957 feet. Seven-inch casing was cemented on top of the oil sand. Brooks 11 was originally drilled to 6564 feet, showed salt water at that depth, and was plugged back and side tracked. The same operator's Brooks 14, east of production, was waiting on cement to set after landing a string of seven-inch casing at 6915 feet. Top of the oil sand was logged at 6898 feet.

Cheek Wildcat To Set Casing

Southwest of Amelia field and in the Cheek area, Jefferson County, Magnolia Petroleum Company's Phelan 1, S. Stivers Survey, was circulating at the close of the week waiting on casing which is to be run for a production test of gas sands logged from 8455 to 8478 feet while drilling to 8575 feet. An electrical logging device showed a good gas sand. Phelan 1 stopped in Frio formation.

At Labelle, Jefferson Parish, Sun Oil Company cored gas sand in J. Ward Estate 1, 933 feet south of the discovery well, at 8750 to 8765 feet, and at the end of the week the crew was coring ahead.

On the north side of Amelia Stanolind Oil & Gas Company extended the field northeast when W. P. McCormick 1, H. Williams Survey, came in from 5385 feet flowing 322 barrels of oil daily through a quarter-inch choke, with a tubing pressure of 235 pounds and a casing pressure of 165 pounds. Top of the sand was encountered at 5357 feet, and seven-inch casing was cemented at 5350 feet.

Stanolind Oil & Gas Company's Sargl 2, H. Williams Survey, made 276 barrels of fluid daily, 30 percent salt water, from 5986 feet through a quarter-inch choke, with a tubing pressure of 1420 pounds and a casing pressure of 1530 pounds.

At Big Hill field, Jefferson County, Stanolind Oil & Gas Company was pulling rods and tubing on Fitzhugh 1, Wm. McFaddin Survey, which indicated some time ago that it would flow oil. After the well was swabbed for

some time it was pumped and the last gauge showed the well making 14 barrels daily.

Seabreeze Well Being Washed

Approximately a half mile west of production at Seabreeze, Chambers County, Sun Oil Company's Hebert Broussard 1-A, T. & N. O. Survey, was being washed at the end of the week. Sand showing gas was logged from 8430 to 8460 feet.

Approximately 4000 feet south of the discovery well at Clinton gas field, Harris County, Stanolind Oil & Gas Company's Oates 1, C. Martinez Survey, was pulling tubing to perforate screen after swabbing failed to show any results, Oates 1, swabbed at 8095 feet, showed only wash water and a little gas. Screen will be perforated around 8100 feet.

In the Cedar Bayou area, Harris County, H. J. DeArman et al's Tyrell & Garth 1, L. Hemingway Survey, was shut down at 7029 feet while an electrical logging device was being run. The company encountered a slight oil showing from 6135 to 6200 feet and a slight gas show from 4140 to 4205 feet. Results of the electrical logging device are not known, but it is rumored that the company will abandon the hole.

Katy Gas Field Extended Southeast

Katy gas field, Waller County, was extended approximately three-quarters of a mile southeast last week when Stanolind Oil & Gas Company completed Hargrove 1, T. S. Reese Survey, Section 110, came in flowing an estimated 3,532,000 cubic feet of gas daily through a quarter-inch choke, with a tubing pressure of 2525 pounds and a casing pressure of 2650 pounds from Upper Saline Bayou sands at 7500 feet. Hargrove 1 was drilled to 7500 feet and seven-inch casing was set at 7295 feet. Screen and liner was run from 7253 to 7500 feet.

Harrison & Abercrombie have two wells at Old Ocean field, Brazoria County, nearing the 10,000-foot mark. Bernard River Land 1-A, a workover, was drilling at 9907 feet at the end of the week and Bernard River Land 4 was down to 9991 feet.

North of the discovery well at Sandy Point field, Brazoria County, Florence Investment Company's Fite 1, D. Talley Survey, was making gas with a small amount of distillate at the end of the week through a quarter-inch choke, with a tubing pressure of 1900 pounds and a casing pressure of 2000 pounds after casing had been perforated with 22 shots from 6467 to 6475 feet.

Over three-quarters of a mile southwest of production at Lochridge field, Brazoria County, Gulf Oil Corporation completed G. L. Wood A-1, Thomas Alsberry Survey, flowing 297 barrels daily through a quarter-inch choke from 6365 to 6370 feet. Tubing pressure was 300 pounds and casing pressure was 600 pounds.

Lochridge was defined to the east when Shell Petroleum Corporation abandoned State Prison Farms 3, J. W. Hall Survey, at 6823 feet after coring salt water sands.

Spanish Camp Extended East

Approximately 1900 feet east of Cloud 1, Elbert Plummer's Sorrell 1, S. F. Austin Survey, Section 1, Abstract 4, Wharton County, was completed making 1,500,000 cubic feet of gas daily through a quarter-inch choke, with a tubing pressure of 1300 pounds after casing had been perforated from 2910 to 2920 feet.

Southwest of Buckeye field, Matagorda County, United North & South Development Company made location for Lambert 1, 653 feet from the west line and 350 feet from the north line of Block 22 in the C. B. & M. Cotton Survey. The same operator's Stoddard 1 was shut down after swabbing at 9850 feet and failing to find anything encouraging. It is understood that the company will drill the well down to 10,000 feet.

TEXAS GULF COAST
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
AMELIA—		
Humble, J. R. Dear 1	660	6779
J. A. Dishman D-1	658	6777
J. H. Phelan 4	600	6779
Stanolind, McCormick 1	322	5385
Sargl 2	52	6020
ANAHUAC—		
Gulf, Knowles 9	430	7118
Humble, Grippon 12	322	7060
Johnson 8	298	7121
White 13	322	7133
Wilcox 5	648	7080
BATSON—		
Gulf, Wing 186	80	540
BOLING—		
John Deering, Moore 1	*	5268
CONROE—		
Humble, South Texas Dev. Co. 5	*	5174
J. K. Hughes, South Texas Dev. Co. 6	*	5126
DICKINSON—		
Pure, S. Hutchings B-1	99	8146
GOOSE CREEK—		
Newton & Lilley 10	20	2074
GREEN LAKE—		
Sun, Hughes 8	*	6147
HANKAMER—		
Gulf, Bingle 2	52	5136
HASTINGS—		
Goldston-Humble, Ross 3	670	6108
Humble, C. Brown B-4	675	6083
Hawley 1	477	6114
C. O'Connor 1	634	6080
Stanolind, Brown 4	868	5928
HULL—		
Guinn Crude Oil Co., Abel A-3	40	567
LOCHRIDGE—		
Gulf, Wood 1-A	297	6386
Shell, Ramsey 3	*	6823
LOUISE—		
Pure, McIntyre 6	*	5160
MANVEL—		
Allhan & Davis, Lambert 1	490	4052
NOME—		
Shell, Unit B-1	340	6048
Texas Public Service 2	330	6050
Sun, Burrows 2	248	6050
PIERCE JUNCTION—		
Gulf, Taylor 42	342	3890
Superior, Whithead B-4	*	3440
SEGNO—		
J. K. Dorrance, S. Wing 1	434	5195
Rajo Oil Co., Wing 1	195	5198
SILSBEE—		
Republic Prod. Co., Brooks Fee 15	1093	6965
SPANISH CAMP—		
Albert Plummer, Sorrell 1	¶1½	4015
TOMBALL—		
Humble, Gossett 6	393	5545
MONTGOMERY COUNTY—		
T. J. Wood, Bertrand 1, sw of Conroe, Hodge sur	*	5371

*Failures; †Junked; ¶Million cu. ft. gas.

GOING TO PARIS
Thompson will represent Oil-World Exposition

Colonel Ernest O. Thompson, railroad commissioner of Texas who will sail June 2 for the World Petroleum Congress meeting which will be in Paris, June 14-19, has been appointed official delegate to represent the Oil-World Exposition. Colonel Thompson will appear before the World Petroleum Congress as official delegate to present technical papers pertaining to the petroleum industry, having been requested by this congress to present this data before their convention. Accompanying him as technical advisor will be R. W. Byram of Austin, an associate editor of The Oil Weekly.

Colonel Thompson will also present to foreign oil men present at the World Petroleum Congress an invitation to attend the Oil-World Exposition this year at Houston, Texas, October 11-16. Numerous foreign oil men have already written to the exposition for hotel reservations.

COLONEL E. O. THOMPSON

Stringent regulation for water drilling

Austin. — Stringent regulations for drilling wells on submerged lands along the Texas Coast have been issued by State Land Commissioner William H. McDonald after a conference with oil operators and officials of the Texas Railroad Commission.

The regulations require a minimum of three strings of pipe. These include 80 feet of conductor casing, a minimum of 1000 feet of surface casing and an oil string. Each string must be heavily cemented.

Every precaution has been taken to prevent pollution of coastal waters. Two hydraulic-type blowout preventers must be installed on each well. Well-head fittings must be tested to 6000 pounds.

Should leaks develop, the rules require that wells be killed and unless the leak can be stopped otherwise, full strings of new casing must be installed.

LEON L. SHIELD, 50, West Central Texas operator, was fatally injured May 25 while visiting in Dallas. He was a native of Coleman, Texas.

World's deepest well shut in for lack of storage.

* * *

Having trouble with west extension well at Vinton.

* * *

Salt proven on Henderson prospect by Texaco wildcat.

Lake Charles.—Drilling activity in the Louisiana Gulf Coast was back to normal last week after much excitement the previous week when the deepest commercial producer in the world was brought in and a St. Mary Parish wildcat blew out at 12,261 feet. Wildcat development, routine activity in proven fields, and new locations were the most important developments in this area during the past seven-day period.

Humble Oil & Refining Company's Ellender 1, Houma, Terrebonne Parish, was making 418 barrels of 37.5 gravity pipe line oil daily through a quarter-inch choke with a tubing pressure of 3300 pounds and a casing pressure of 4000 pounds May 28. This well came in May 20, flowing oil and wash water after 7-inch casing had been perforated from 11,610 to 11,615 feet.

Latest development at The Texas Company's Horseshoe Bayou 1 on Horseshoe Bayou, St. Mary Parish, which blew out, caught fire, and bridged at 12,261 feet, is that the company is preparing to move in a drilling barge to carry it deeper. Reports are that the well has a good chance of becoming the world's deepest commercial producer and beating the record set by Humble Oil & Refining Company's Ellender 1.

Continental Will Drill Another 12,000-Foot Well

A 12,000-foot well is planned for Abbeville field, Vermilion Parish. Continental Oil Company made location for J. A. Brookshire 1, 610 feet north of the railroad right-of-way and 750 feet east of the west line of the tract in Section 66-12s-3e. It is approximately 1000 feet east of the discovery well. The company's Hebert 1, the discovery well, was drilled to 12,216 feet before it was plugged back and completed at 7600 feet as a gas and distillate producer. This well was the first 12,000-foot test drilled in the Louisiana Gulf Coast and the second in the world. Hebert 1 had showings of oil and gas below 12,000 feet, but due to difficulties the operators stopped at 12,216 feet and casing was set below 11,000 feet. On Brookshire 1 the company may drill even deeper than 12,216 feet. It is predicted the well will be the most interesting in Louisiana when drilling operations are commenced. Loffland Brothers, drilling contractors, will drill the hole.

One mile west of production at Vinton, Calcasieu Parish, Woodley Petroleum Company's Matilda Grey 1, 32-10s-12w, was being swabbed at 3512 feet after it had come in flowing from 12 to 20 barrels of 35 gravity oil per hour through a quarter-inch choke and then sanded up. Swabbing has been going on for several days. At last reports the test was showing only a littlegas and no oil. Grey 1 may have clogged up the screen, which was run before the test was made. Several wells completed in this area some time ago showed a large percentage of paraffin and gave considerable trouble. Grey 1 was drilled to 3748 feet and encountered sands showing oil from 3510 to 3521 feet. Seven-inch casing was set at 3600 feet.

Fenton Wildcat Coring Gas Sand

Louisiana Crusader Oil Company's Langley 1, Fenton area, Section 36-7s-5w, Jefferson Davis Parish, was coring shale with streaks of sand at 8049 feet at the end of the week after a sand

SOUTH LOUISIANA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BAYOU BLUE—		
Humble, Wilbert 2	33	1757
GILLIS—		
Union Sulphur, Barbee Estate 14	*	6730
LAKE PELTO—		
Texas Co., State Lake Pelto 16, perf 6058-88 ft	800	7136
TEPETATE—		
Continental, Welsh A-8	180	8306
WEST HACKBERRY—		
Stanolind, Little 1	*	4634
EVANGELINE PARISH—		
Bel Cheney Springs Oil Co., Fee 1, 10-2s-1w	*	2214
ST. MARTIN PARISH—		
Texas Co., St. Martin Land Co. 9, Henderson prospect, 21-8s-7e	*	8858
TERREBONNE PARISH—		
Humble, Ellender 1, Houma gas field, 23-19s-19e, perf 11,610-615 ft	826	12,261

*Failures; †Junked; ¶Million cu. ft. gas.

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SHREVEPORT, LOUISIANA

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Lake Charles—Houma—Converse
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which showed gas was cored from 8016 to 8021 feet. Another gas sand was logged at 7892 feet. The test has encountered several sands and shales showing gas while drilling to 8049 feet, and will probably run an electrical logging device to the bottom of the hole after drilling to the desired depth.

On the southwest side of Jennings, Acadia Parish, Superior Oil Producing Company was reaming to set seven-inch in Leckelt 3, Section 42-9s-2w. Sand and shale showing oil were logged from 6669 to 6731 feet. Casing will be cemented on bottom and perforated.

New Acadia Parish Wildcat

An important wildcat location was announced in Acadia Parish by John Mayo et al: Bank of Commerce & Trust 1 ls 330 feet north and east of the southwest corner of Section 19-7s-1e. The wildcat is located northeast of the Trilby prospect, between Tepetate and Bayou Mallet fields, and west of the Churchpoint prospect. Humble Oil & Refining Company, Magnolia Petroleum Company, Shell Petroleum Corporation, Gulf Oil Corporation, Stanolind Oil & Gas Company, Woodley Petroleum Company, and Continental Oil Company have been active in this area doing geophysical work and taking commercial leases.

The Texas Company's St. Martin Land Company 9, Henderson prospect, Section 21-8s-7e, St. Martin Parish, was abandoned after showing salt water on a drill stem test at 7945-70 feet. The test was drilled to 8858 feet in salt, after having logged the top of it at 8848 feet. It is the first test in the Henderson area to encounter salt.

Reaming Lafitte Outpost

Three fourths of a mile east of production at Lafitte, Jefferson Parish, The Texas Company was reaming on State Bayou Norman 1, Section 28-17s-24e, at 9399 feet after drilling to 9421 feet. It is reported that oil sand was encountered and will be tested. The same operator's Rigolets 7, Section 29-17s-24e, southeast of production at Lafitte, was drilling in shale at 9587 feet after having logged sand with an odor of oil from 9329 to 9366 feet.

In Plaquemines Parish, Gulf Oil Corporation's location for State Quarantine Bay "QQ" 3 is 2640 feet south and 330 feet east of the northwest corner of Section 17-19s-17e.

On the Marchland prospect, Lafourche Parish, William Helis' City of New Orleans 1, Section 19-23s-23e, set seven-inch casing at 7607 feet, perforated with 60 holes from 7303 to 7333 feet, and recovered 5700 feet of salt water on a 20-minute drill stem test through ⅜-inch chokes. Plugged back the test was preparing to perforate from 7270 to 7280 feet and make another drill stem test.

Shell Petroleum Corporation was drilling below 9629 feet in Pellekaan 1, Gibson field, Section 35-17s-15e, Terrebonne Parish. This is below the regular producing horizon. A slight showing of oil was encountered from 8887 to 8894 feet and from 8954 to 8958 feet.

Shell Petroleum Corporation's Boagni 1, Section 48-8s-4w, St.Landry Parish, was abandoned last week at 9006 feet after running an electrical logging device. A sand with a trace of oil was encountered from 8509 to 8520 feet.

NORTH LOUISIANA

Rodessa deep test is showing gas at 6500 feet.

* * *

Rodessa outpost in Marion County shows in Hill sand.

* * *

Lisbon field is extended in two directions.

Shreveport.—Of outstanding interest last week in Louisiana were several Rodessa outpost and deep tests, and extension of the Lisbon field in two directions.

Rodessa Outposts Test

The best indication so far obtained of Rodessa's producing possibilities below its present lowest horizon was given last week, when United Gas Public Service Company's Land 1, Robert Potter Survey, Cass County, Texas, showed an estimated five to seven million cubic feet of wet gas. The well was plugged back from 7255 feet, and casing perforated at 6520-25 feet for the test. Casing and tubing pressure were equalized at 2000 pounds. No definite gauge has been made. This test is south of the fault in the gas producing part of Rodessa.

The Marion County, Texas, end of the Rodessa field, which recently added a good well in the Gloyd horizon, gave indications last week of yielding production from the Hill horizon in another test in the area, which is 14 miles southwest of the main Rodessa field, and 5½ miles southwest of the nearest Gloyd outpost producer. Arkansas-Louisiana Gas Company's Braden 1, Thomas Hanson Survey, logged sand showing oil spots in a core from 5813-28 feet in the Hill horizon and was preparing to drill ahead.

Three new tests are rigging up in the vicinity of The Hunter Company's E. W. Fonda 1, A de los Santos Coy Survey, farthest southwest Gloyd producer in the field. The well ceased flowing after one week, but was soon revived, and on a Texas Railroad Commission 24-hour gauge through 7/16-inch choke made 230 barrels. The gas-oil ratio was 635 to 1.

The gas-oil line of demarcation along south edge of Rodessa's production on the Cass County side of the field was further defined last week, when United Gas Public Service Company completed Clements 2, W. B. Hughes Survey, as a gas well at 6090 feet in the Young formation. In the Robert Trammell Survey, Cass County, the company's Bauguss 6 swabbed dry at 6035 feet.

A direct north offset to Lion Oil Refining Company's recently completed Holm 1, NW SE SE 9-23-15w, which extended northeast producing limits slightly, was testing in the Young horizon last week at 6075 feet. The test is Drillers, Inc.'s, Glassell-Means 1, SW NE SE 9-23n-15w, which logged 10 feet of saturated lime.

Hope of getting Rodessa production across the line into Miller County, Arkansas, was dimmed as W. L. McClanahan and associates' Capps 1, NE SW 11-20-28, drilled ahead at 5235 feet, without having picked up any markers.

Lisbon Is Extended

The Lisbon field was extended one location in two directions, northwest and southeast, last week by two producers. One location southeast of previous production and extending the limits of the field across the Claiborne Parish line into Lincoln Parish, Lyons and Neely's Bennett 1, NW NW 6-20n-4w, was completed at 5342 feet flowing 11 barrels per hour through various sized chokes. This test had saturation from 5323 to 5327 feet and from 5331 to 5340 feet; elevation is 329 feet. Later the was treated with acid and flowed 22 barrels hourly by ⅜-inch choke.

A northwest edge well that had only four feet of saturation, and indicates the producing horizon may be pinching out in that direction, was completed successfully by J. B. Bond in H. E. Patton 1, NW NW 36-21n-5w, at 5265 feet it gauged 310 barrels in 24 hours through 25/64-inch choke.

McAlester Fuel Company was arranging to abandon a wildcat test in Cass County, Texas, near Douglasville, its Dooley 1, Calloway Davis Survey, at 6505 feet. With elevation of 246 feet this test logged massive anhydrite from 6149 to 6214 feet. Paluxy had been topped at 4530 feet.

In the western part of Cass County and the eastern part of Morris County, near Hughes Springs, W. L. Pilkington of Shreveport has assembled a block of approximately 8000 acres. In Northeast Cass County, L. L. Deaton and associates made location for Peal 1, James Taylor Survey, for a Glen Rose test, and five miles north of Rodessa production McCabe and associ-

ates made location for J. B. Rodgers 1, Samuel Gregg Survey.

H. A. Stebbinger and associates last week perforated casing and tested an estimated two million to 10 million cubic feet of gas, and distillate estimated as high as six barrels per hour, in Pickering Lumber Company 2, A. Hanson Survey, Shelby County, Texas, which previously at 5126 feet had tested hot salt water. The casing was perforated at 5033 to 5037 feet after plugging back to 5077 feet. Cement had been drilled out to 5054 feet.

Patsam Petroleum Corporation's A. G. Vincent 3, G. P. Harrison Survey, a Tokio horizon test in the Waskon field, Harrison County, Texas, after being treated with 1500 gallons of acid at total depth of 2385 feet, flowed 23 barrels of oil per hour, indicating it may be the best of any of the recently completed Tokio wells in this field.

The same operators' Brown 1, Section 1-19n-6w, recently completed as a Travis Peak oil well gauged 33 barrels of oil in 24 hours last week and Dobbins 1, NE NE 12-19n-6w, also in the Travis Peak is making four barrels per hour through 5/16-inch choke.

Deep Rock Oil Company's and Kirk-Greenway Drilling Company's Glen Rose test in the shallow Converse field, Sabine Parish, proved disappointing last week. The test, Whitney Corporation 1, Section 8-9n-13w, in a six-hour drill stem test from 5202 to 5709 feet showed 4025 feet of mud and salt water. Testing tool was open one-half inch at top and bottom. Testing operations were temporarily suspended. The disappointment in this test was heightened by the fact that Whitehurst and associates' Whitney Corporation 1, an offset, which was lost as a junked hole was reported to have had 27 feet of saturation at total depth of 5503 feet but had a blow-out of gas around the casing and threatened to crater. It was killed and plugged back and enough gas secured from it to use as fuel in drilling the present hole.

Locations for two 6000-foot wildcat tests were made last week in North Louisiana.

Two miles north of the two Trinity gas-distillate wells at Simsboro, Lincoln Parish, both in Section 10-17n-4w. Burford and associates of Dallas, Texas, announced location for a 6500-foot test, Nanna 1, west half SE 34-18n-4w, Lincoln Parish. These operators have three 40-acre units in this section and more than 500 acres around the location.

This gives Lincoln Parish its fourth projected 6000-foot wildcat test. H. D. Easton and Belmont Quadrangle Drilling Company's G. W. Dye 1, NE NE 21-19n-4w (amended location), last week was spudded for a 6000-foot test on 12,000 acres. E. T. Oakes, discoverer of Lisbon, and H. D. Easton and associates have derrick up for R. L. Sanderson 1, Section 31-18n-1w, and are completing arrangements to move in rig at once. Glassell and Glassell's A. P. Gray 1, Section 16-20n-3w, is drilling below 4450 feet in lime.

The other location for a 6000-foot wildcat is Whitehurst and associates' LeLong 1, center North half 25-12n-11w, Red River Parish, in the southern part of the Bull Bayou field. This block of about 3000 acres was assembled several weeks ago.

ARKANSAS FIELDS

Second Schuler well expected

El Dorado, Arkansas.—With one test having perforated casing and arranging to make production test, another operation in the new Schuler area, Union County, Arkansas, showed producing possibilities last week in the 5500-5600 foot producing horizon, identified by many as upper Permian, opened recently by Lion Oil Refining Company's Edna Morgan 1, Section 18-18-17, which last week continued to average 288 barrels daily.

A north offset to the discovery well, Marine Oil Company's M. Justiss 1, SWc Lot 7. NW 18-18-17, after setting seven-inch casing on bottom at 5660 feet, perforated at 5591 to 5601 feet for production test. This well with elevation of 259 feet logged gas sand from 5593 to 5603 feet and an oil sand from 5607 to 5611 feet and then logged an oil sand laminated with shale from 5611 to 5624 feet.

Lion Oil Refining Company's Edna Morgan B-1, SW NW SE 18-18-17, southeast offset to the discovery well, was taking another core last Thursday after showing eleven thribbles of oil and two thribbles of mud and drilling water in a 15-minutes drill stem test, opened one-half inch on top and bottom, with tester set at 5532 feet. This formation is believed above the horizon from which the Edna Morgan 1 is producing at 5559 feet.

One-half mile east of the producer, Alice Sidney Oil Company's (Dr. J. S. Rushing) was drilling at 5467 feet.

A 4500 foot test is planned by W. B. Street and Walter Lown on a block of wildcat acreage they have assembled in township 14, ranges 17 and 18, Ouachita County, Arkansas.

Fohs Oil Company has been leasing scattered 40- and 80-acre tracts recently in Columbia County, Arkansas in townships 17 and 18, ranges 19, 20 and 21. Robert Keen's Runyon 1, Section 1-16-21, Columbia County, on a 4000 acre block where derrick is up calls for a 5000 foot test to spud by June 26. Standard of Louisiana has been leasing in Section 18-22-23.

Phillips Petroleum Company and Joe Modisett have secured an extension until July 1 to spud a Permian lime test in Section 18-17-9, Ashley County, where location until recently was for several weeks under water.

Four Arkansas permits

El Dorado. — Four drilling permits were authorized last week by the Arkansas board of conservation, as follows: Cleveland County—Texas Canadian Development Company, Incorporated, I. E. Moore Estate 1, 330 feet north and west SEc NE NE 22-9-10; Dallas County—J. C. Voyles, R. A. Harmon and J. C. Kelly, Holly Springs, Arkansas, Sorrells 1, center SE SE SW 35-10-16; Miller County—Standard Oil Company of Louisiana, Shreveport, Mrs. Sarah Harvey 1, 660 feet north and east SWc SW SW 33-16-26; and Ouachita County—Copenhaver Oil Corporation, Camden, Arkansas, J. E. Evans 1, 300 feet south and west NEc NE SW 20-11-19.

Plan 5000-foot Alabama test

Montgomery, Ala.—Joseph Modissett & Sons Company has leased 350 acres of state park land in Choctaw County and will spend $100,000 to sink a 5000-foot wildcat in the section, according to Page S. Bunker, head of the Alabama forestry department, who announced the lease last week. Site of the operations is near Bladon Springs, and the lease was granted on the recommendation of State Geologist Walter B. Jones.

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NEW MEXICO

Wildcat 2¼ miles southeast of Jal is productive.

* * *

Northern outpost of Sandy lime belt bails dry.

* * *

Texaco Mattix area well fails to flow commercially.

Hobbs, New Mexico.—A southwestern Lea County semi-wildcat partially isolated from oil production by gassers and a failure responded to acid treatment with a prolific oil flow from sandy-lime section at 3280 feet, or 269 feet sub-sea. Gulf Oil Corporation's George W. Shahan 1, C NW NE 33-25s-37e, about 2¼ miles southeast of Jal, provided the surprise development last week by flowing 125 barrels daily natural. It gauged 78 barrels of oil the first hour and 75 barrels the second hour, after using 2000 gallons of acid. Production was then shut in to erect more tankage.

Previous tests in a northwest and west direction drilled to water and plugged back for gas, while a test about one mile northeast checked low on structure and missed oil and gas showings in drilling to 3652 feet.

A remote chance for oil production was given Shahan 1 on the strength of The Texas Company's Shepherd 3-B, SW NE NE 5-26s-37e, about one mile southwest of the oil strike, yielding a small amount of oil with water at 3290 feet, or 300 feet below sea level. The latter was plugged back and casing gun perforated to complete as a dry gasser last April.

Magnolia Petroleum Company's Hanna 1, C SE NE 7-26s-38e, about 5 miles southeast of Shahan 1, is rated as an important wildcat and was fishing for tools at 2705 feet, with an elevation of 3024 feet. It is 1¾ miles east by north of a 4110-foot failure that passed up free oil at 3450-55 feet. Hannah 1 is less than two miles west of the Texas border.

Continental Oil Company et al's Eaves 2-A-30, C NW NW 30-26s-37e, situated near the south end of the Eaves-South Jal lime area, averaged 13 barrels of fluid per hour, 60 percent basic sediment and water, for 16 hours at 3169 feet, with an elevation of 3169 feet, and will deepen. Productive limits of this area overlap into Winkler County, Texas.

Lea County accounted for 13 new operations and 16 completions the past week. The latter included 13 oil wells, a small gasser and two failures.

Three New Ones for Langlie

The Langie sandy lime area to the east of Jal was allotted three locations, including Anderson Prichard Oil Corporation's Lanehart 1, NE NW SW 21-25s-37e; Gulf Oil Corporation's Westfall 2, C NW SE 15-25s-37e; and Jal Natural Gas Company's Justis 2, C SE NE 20-25s-37e.

Harry W. Leonard et al's Siddall 1, C SW SW 6-20s-38e, northernmost prospect in the sandy lime belt, bailed dry in saturated lime zone at 3890-4107 feet, with 5½-inch pipe at 3748 feet. It has deepened to 4182 feet. Elevation is 3588 feet. The test is seeking production from Hobbs lime formation.

The Texas Company's Ellen Weir 1, C NE NE 14-20s-37e, nearest sandy lime trend prospect, resumed drilling at 4074 feet and developed a fishing job at 4084 feet. Stanolind Oil & Gas Company's Turner 1, C NW NW 20-20s-38e, logged the top of anhydrite at 1415 feet and has cemented 9-inch pipe at 1450 feet.

Continental Oil Company et al's Burger 1, C NW SW 19-20s-38e, east offset to an outpost producer, used a formation tester at 3685-3695 feet and tested dry. Five-inch casing will be cemented at the latter depth. This well blew out at 3020 feet, and the gas registered 1320 pounds pressure when shut in.

Illinois Oil Company et al's Alston 1, C SW NE 31-17s-37e, wildcat on the northwest trend from Hobbs field, was drilling near the 4500-foot level. No oil or gas showings have been recorded. It is checking low on structure.

In the Mattix area, The Texas Company's Fristoe 1, SW NW 35-24s-37e, failed to make a commercial producer when tested through tubing at 3531 feet, or 330 feet sub-sea. The well flowed several heads after using 2000 gallons of acid, and will be given a second treatment.

Plains Production Company has started operations on Humphrey 1, NE 3-25s-37e. El Paso Natural Gas Company's Camp 1, C SW SW 6-24s-37e, midway between the Mattix and Cooper fields, tested 16,000,000 feet of dry gas at 3210 feet, and has pulled tubing to deepen after killing the gas flow.

On initial gauge of 135 barrels of oil through 12/64-inch choke has been given Stanolind Oil & Gas Company's Myers 4, C SE SW 22-24s-37e after a nitro shot at 3455-3565 feet.

The promising outlook heretofore held for broadening the producing area on the north end of Monument field scored a setback when Gulf Oil Corporation's State-Kutter 1-C, C SE NE 18-19s-37e, offsetting the northernmost well, missed the big gas flow in the oil horizon at 4026 feet, or 320 feet sub-sea. This well flowed 187 barrels of oil in six hours natural, with gas volume rated at 484,000 feet daily, and then quit heading. It was treated with acid and made 95 barrels in five hours through ¾-inch choke. Repollo Oil Company's Barber 7, NE SW NW 8-20s-37e, which is establishing a record for absorbing rotary fluid, cement, cotton seed hulls and fiber, has cemented 7-inch pipe at 3205

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NEW MEXICO
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
LEA COUNTY (Eunice)—		
Gulf, State-Arnott-Ramsey 13-C, c se nw 21-21s-36e	1200	3902
State-Leonard 4, c sw ne 22-21s-36e	*	3905
W. W. White 4, c sw se 25-20s-36e	1000	3850
Oil Well Drl. Co. et al, State 1-A, c nw nw 16-22s-36e	100	3804
Phillips, State-Mex 1, c ne ne 30-20s-37e	286	3843
Shell, State 2-M, lot 9, 1-21s-35e	1500	3857
Tide Water Associated, R. M. Marshall 1, c sw ne 13-21s-36e	*	4005
LEA COUNTY (Hobbs Field)—		
Stanolind, State 29, c sw ne 9-19s-38e	13,478	4178
LEA COUNTY (Mattix)—		
Gulf, C. D. Woolworth 1, c ne se 30-24s-37e	¶¼	3217
Stanolind, C. Myers 1, c ne sw 22-24s-37e	150	3552
LEA COUNTY (Vacuum)—		
Magnolia, State 1-G, nw nw ne 24-17s-34e	268	4905
LEA COUNTY (Monument)—		
Amerada, State 2-M, c nw se 13-20s-36e	1000	3865
State 2-Y, c nw se 17-20s-37e	2500	3854
State 1-Z, c ne ne 13-20s-36e	4000	3864
Gulf, Hatchett 2, c sw nw 33-19s-37e	50	3905
State-Bell 2-G, c sw se 13-20s-36e	600	3876

*Failures; †Junked; ¶Million cu. ft. gas.

feet with the hole bottomed in crevice at 3840 feet, in order to exclude some of the troublesome gas from the upper lime.

Continental Oil Company's State 1-C-16, C SW NW 16-20s-37e, is rigging up to deepen from 3809 feet after converting into a gas well. Blowout and fire at this well on April 15 cost the lives of three workmen, and when placed under control a week later was making a heavy flow of oil with gas.

Three of the five completions credited to the Monument field the past week were on the southwest edge of the field. Amerada Petroleum Corporation's State 2-M, C NW SW 13-20s-36e, flowed 446 barrels initial through ½-inch choke after using dual acid job at 3865 feet, and State 1-Z, C NE NE 13-20s-36e, flowed 937 barrels natural through 1-inch choke in 8¾ hours at 3864 feet. The same company's State 2-Y, C NW SE 17-20s-37e, tested 12,000,000 feet of gas at 3854 feet, and with packer at 3830 feet flowed 42 barrels oil per hour natural through 1-inch choke, with gas volume rated at 788,000 feet daily. It has an elevation of 3539 feet. Gulf Oil Corporation's State-Bell 2-G, C SW SE 13-20s-36e, flowed 105 barrels natural in 5 hours through open tubing at 3876 feet or 325 sub-sea.

Shell Petroleum Corporation has started work on State 3-E, C SW NE 13-20s-36e. Continental Oil Company et al have placed contract for the drilling of Reed 1-A-14, C NE NE 14-20s-36e.

One of the few remaining undrilled locations in the heart of the Monument area was covered the past week when Repollo Oil Company started work on Phillips 4-B, SW SW NW 31-19s-37e.

An initial rating of 268 barrels on pump has been earned by Magnolia Petroleum Company's State 1-G, NW NW NE 24-17s-34e, second producer for the Vacuum area, after repeating nitro shots and acid treatments in lime at the plugged back depth of 4793 feet. This new producer and the original well are without a market outlet. Continental Oil Company et al's Farney 2-A-5, C NE SE 5-23s-36e, is a new operation for the Lynn lime area, located on a direct strike between the Cooper and Eunice fields.

Skelly Oil Company has started work on H. O. Sims 3, C SW NW 3-23s-37e, offsetting production in the Skelly field. The tight lime condition encountered by tests on the north end of the Eunice lime area is proving a boom for the acid business. Phillips Petroleum Company's State-Mex 1, C NE NE 30-20s-37e, had been completed, flowing 286 barrels oil and 1,400,000 feet of gas after a liberal use of acid and a nitro shot at 3843 feet. The same company's State-Quapaw 1, north offset, has had more resistance and flowed mostly acid water after using 10,000 gallons at 3864 feet, having previously used nitro and 14,000 gallons of acid solution at 3840 feet. Gulf Oil Corporation's White 4, C SW SE 25-20s-36e, flowed 108 barrels oil in three hours from lime at 3750-3850 feet, with an elevation of 3546 feet. Humble Oil & Refining Company has made location for Willis 1, a west offset. Atlantic Refining Company has started work on State 2-0, C NW NW 32-20s-37e.

In the south portion of the field, Midcontinent Petroleum Corporation has rigged up to drill Greer 2, C NW NW 21-22s-36e.

ASK CONTINUANCE
To present compact resolution to president

Oklahoma City.—W. J. Holloway, former governor of Oklahoma and now attorney for the Interstate Oil Compact Commission, will present a resolution, seeking extension of the compact for another two years, to President Roosevelt in Washington May 31. Holloway left last week for Washington for the purpose of gaining congressional approval of the compact, which has been extended by the legislatures of Texas, Oklahoma, Kansas, Colorado and New Mexico.

Unless extended by congress the compact will cease to have federal sanction September 1.

The meeting of the compact commission, previously scheduled for June 11 in Santa Fe, New Mexico, has been postponed until July 12. It is hoped by that time that the report of the Bureau of Mines as to the quantity of oil in storage will be available.

NAVAL RESERVE
Committee cannot finish investigation by June 1

Washington, D. C.—All hopes that the special oil committee of the house naval affairs committee could complete its investigation of the possibilities of recovering lands in Naval Reserve No. 1, which had been patented to the Southern Pacific Railroad, by June 1, were dissipated this week when it was learned that the questions to be propounded to the attorney general have not yet been sent to the navy department for transmission to the department of justice.

The investigation was ordered during hearings before the committee on the Walsh bill to consolidate the naval reserves, when it was disclosed that no formal opinion had ever been rendered by the department of justice as to the possibility of recapture of the lands by the government.

The lands in question constitute a considerable portion of the reserve, held by Standard Oil Company of California, and the bill before the committee authorized the secretary of the navy to make exchanges with the oil company or to secure the lands by purchase or condemnation, in order to consolidate the government's holdings and minimize the danger of drainage.

Members of the subcommittee appointed to draft the questions on which the attorney general was to be asked for an opinion explained that the matter had been held up by the pressure of other business.

LABOR LEGISLATION
New bill introduced into Congress

Washington, D. C.—Wage and hour legislation designed to carry out the purposes of the former National Recovery Act was introduced in Congress May 24 following receipt of a message from President Roosevelt requesting the development of "labor standards which will permit the maximum but prudent employment of our human resources to bring within the reach of the average man and woman a maximum of goods and of services conducive to the fulfillment of the promise of American life."

As introduced, the measure did not definitely fix the maximum working week or minimum wage, but expectations are that the former will be fixed at about 40 hours and the latter probably at 40 cents an hour, in general, but the five-man board which is to administer the law is to be given authority to set the hours and wages for each industry separately.

Every effort will be made to avoid the mistakes which ruined the NRA effort, and in the setting of hour and wage standards for the various industries the administrative board will have the assistance of advisory councils from the interested industries, on which employers and labor will be equally represented.

As a further check against the imposition of too onerous restrictions, the board will be prohibited from ordering a maximum working week of less than a specified number of hours, tentatively fixed at 35, or minimum wages in excess of $1200 a year or 80 cents an hour.

Hours and wages for each industry will be set on the basis of those adopted by the more "enlightened" concerns in the industry, with consideration given to those fixed by agreements with unions, reached by collective bargaining.

The legislation is not to apply to employers of less than 15 persons, nor to local service or retail industries, but will apply to purely intrastate activities where they may have an effect upon competition in interstate commerce.

Hearings were called by the Senate and House labor committees immediately upon introduction of the legislation and it is planned to enact it, if possible, before July 1.

SIX GET SENTENCED
Violation of Connally Act draws 8 years, $46,000

Houston.—Charged with violation of the Connally act in an indictment alleging they shipped hot oil from Conroe out through the port of Houston, six men were sentenced here May 22 by Federal District Judge T. M. Kennerly. Five of them were fined a total of $46,000, and all six received suspended jail sentences.

Those sentenced and their sentences follow: Frank W. Bennett, $10,000 and 18 months; A. N. Adelson, $10,000 and 18 months; George Arnold, six months; D. D. Feldman, $10,000 and 18 months; Oran C. Roberts, $8500 and 18 months; M. D. Carter, $7500 and 18 months.

A.A.P.G. MEETING

Tulsa.—American Association of Petroleum Geologists will hold its mid-year meeting October 14, 15 and 16 at the William Penn hotel in Pittsburgh, Pennsylvania, according to an announcement by J. P. D. Hull, business manager of the organization with offices in Tulsa. New Orleans is the convention city for 1938.

ROCKY MOUNTAIN FIELDS

Tri-State area gets play from California companies.

* * *

Seismograph crews active in widely scattered areas.

* * *

Looking for Sundance oil five miles from Lance Creek.

Casper, Wyo.—Among recent entrants to the lease play in northwestern Colorado, Italo Petroleum Company and Universal Consolidated Oil Company have released a location on a block adjoining Mountain Fuel Supply Company's acreage in Powder Wash field. The location is Wanner-Government 1, SE NE 36-12n98w, a northeast offset to the Mountain Fuel's J. C. Donnell 1, NE SE 31-12n-97w, which is drilling at 4470 feet.

The Mountain Fuel well is about 1000 feet from its objective, a Wasatch sand in the lower Tertiary beds, where the company's discovery well on Powder Wash developed high gravity oil. Italo Petroleum Company and Universal Consolidated Oil Company are among the several California concerns which have taken acreage in the Tri-State Basin area embracing northwestern Colorado, southwestern Wyoming and northeastern Utah.

Superior Oil Company is moving in material for James 1, 11-12n-93w, deep test of the Baggs gas structure near the Colorado line in Carbon County, Southern Wyoming.

Well Nearing Completion

In North Baxter Basin gas field, southwestern Wyoming, Mountain Fuel Supply Company is moving in rotary for Charles Stone 1, SW SW 18-19n-103w. The company's Union Pacific 2, SE NE 15-16n-104w, in the South Baxter Basin gas field, is setting 8⅝-inch production casing at 2246 feet on top of the sand.

On Dry Mountain structure in Moffat County, Colorado, Anderson-Kerr Drilling Company and Phillips Petroleum Company's Government 1, CSE SE 19-9n-99w, has landed 10-inch casing at 2240 feet and will carry the casing as it drills ahead. Anderson-Kerr's Gail-Mars 1, CSE NE 17-11n-100w, Shell Creek structure, Moffat County, is moving in tools from Oklahoma.

Morapas Dome Gets Test

Another Tri-State Basin test to get under way this week is Morapas Petroleum Company's M. E. Coles 1, SW SW SE 1-3n-92w, on Morapas Dome fault block, Moffat County, drilling at 725 feet with 15½-inch casing set at 190 feet.

Seismograph crews are again moving in for geophysical reconnaisance work through widely scattered areas in the Rocky Mountain division. The Texas Company and The California Company have a crew working on Wilson Creek structure in Rio Blanco County, northwestern Colorado, for a detailed study of the structure.

Geophysical crews are working in the Cherokee Ridge area along the southeastern corner of Sweetwater County, southwestern Wyoming. South of Rawlins, Wyoming, another crew is making a survey.

The California Company is having a survey made of the Nesson structure, a large anticlinal uplift in McKenzie County, North Dakota. in Harding County, South Dakota, a geophysical crew is working on the Camp Crook structure. On a 40,000-acre block near Mitchell, Nebraska, held by the Felmont Oil Corporation, Houston, a survey is being made.

Good Big Medicine Bow Well

An excellent completion was made this week by Ohio Oil Company and The California Company in Kyle 2, CSE SE 26-21n-79w, Big Medicine Bow field, central Wyoming. The well gauged 137-barrels of oil per hour and 17,000,000 cubic feet of gas daily, completing in the first Sundance sand at 5476-54 feet and in the second Sundance at 5655-68 feet. They are moving in rotary for Kyle 3-A, SW NE 26-21n-79w, and their Union Pacific 4, CSW SW 25-21n-79w, is a near completion, testing the first Sundance sand at 5412-76 feet. The well plugged back from the second Sundance at 5544-5615 feet, where it developed water.

In the Quealy Dome field, The California Company's Holst-Wolf 1, NW NW NW 19-17n-76w, Albany County, southern Wyoming, is a near completion at 4067 feet. The company's Holst 7, NE NE SE 13-17n-77w, is drilling at 2154 feet.

MOUNTAIN STATES

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
MONTANA		
GLACIER COUNTY (Cut Bank Field)—		
Glacier Production Co., A. Corigeaux 1, ne ne ne 21-23n-5w	276	2967
Fuller 2, nw se 17-33n-5w	92	2967
Dakota-Montana Oil Co., Tribal 1-136, lot 5, 15-34n-6w	43	2960
WYOMING		
WESTON COUNTY (Osage Field)—		
R. L. Rose, 7, csw se 8-46n-63w	*	350
Henry Egert, 5, nw se 8-46n-63w	5	335

*Failures; †Junked; ¶Million cu. ft. gas.

Lance Creek Busy

Developments in the Lance Creek field, eastern Wyoming, showed excellent progress during the past week. One completion, Ohio Oil Company's Richards & Comstock 2, NE SW 32-36n-65w, was brought in this week for 20 barrels per hour from basal Sundance formation at 3683-3778 feet. This well originally was completed at 3650 feet in the upper Sundance in 1932 for an initial production of 140 barrels of black oil per day. The company's Carrie Putnam 2, NEc SW NW 4-35n-65w, is nearing completion in the basal Sundance at 4106 feet. A drill stem test showed 30 barrels per hour. Operators are cementing 712 feet of 4½-inch liner on top of the formation at 4084 feet and preparing to test. This well is a former gas producer originally completed in 1922 for 20,000,000 cubic feet of gas daily from the Muddy sand at 3430 feet.

Another near completion in the field is Argo Oil Company's Ford 3, SW NW 33-36n-65w, which is waiting on pumping equipment for a test of the basal Sundance logged at 3956-4046 feet. Hole has been deepened from 3985 feet, where it was completed in March for 25 barrels daily on the pump.

Five miles east of nearest Sundance production Continental Oil Company is building derrick for Leach 1, CSW NE NE 29-36n-64w, on a block approximating 8000 acres, covering the east end of Lance Creek field, which has yet to be tested for Sundance production.

The deep test of unexplored Sundance in the Billy Creek gas field on the northwestern rim of the Powder River Basin, Johnson County, Wyoming, Carter Oil Company's Rider 3, is reaming at 836 feet to lower the 13-inch casing at 890 feet. It logged the Shannon sand at 862-890 feet; depth is 1325 feet. The Billy Creek field was proved several years ago for gas production in the Frontier sand. The Sundance is expected at around 4000 feet.

After acidizing with 2,000 gallons in Madison lime, Stock Oil Company's Griffin 1, Lot 60, 4-55n-97w, an outside location on the southern end of the Garland structure, northern Wyoming, flowed 740 barrels in the first 24 hours. The well completed last fall for 400 barrels initial at 4200 feet.

Crew Working in Nebraska

Mitchell, Nebraska.—A geophysical exploration crew began tests May 17 to determine the possibilities for oil development on a 40,000-acre tract 20 miles north of here. The tract is under lease by the Felmont Corporation, Houston, Texas.

CALIFORNIA FIELDS

Expect 65 drilling tests in Wilmington by June 1.

* * *

Ten Section test is second deepest in the world.

* * *

13 rigs running on north dome at Kettleman Hills.

Los Angeles. — Wilmington field, along the water front between Long Beach and San Pedro is the live stop of drilling in California. Late last week there were 40 actively drilling wells in the field, in addition to 41 rigs and 21 locations. It is expected that 65 wells will be actively drilling by June 1.

Wells in this field are completed quickly. A number of holes have been drilled to completion in 15 days, but in most instances it requires 30 days. Predictions are that the drilling campaign will begin to decline in about 60 days.

Seeking Pipe Line

Negotiations are now in progress seeking to get some major purchaser of crude to place gathering lines in the field. A number of companies have lines running close to the field, leading to their harbor facilities.

Oil produced at Wilmington has a sulphur content sometimes running as high as 6 percent. In some instances the more important producers are mixing the Wilmington crude with clean crude, in about one to four mixtures, to make it acceptable. It is understood this crude should be selling at around 80 cents a barrel, according to posted prices and gravity in other fields, but some of the producers are reported to have been selling their output at spot prices ranging from 50 cents a barrel and up at the well.

Producing 38,000 Barrels Daily

Production at Wilmington is running around 38,000 barrels per day and is expected to go higher.

Several of the larger producers are curtailing their wells and recently some 25 of the smaller producers and operators signed a petition directed to one of the major pipe line companies asking for a gathering system. It is understood no company will post a price for the field unless the operators agree to curtail their production to a reasonable figure.

May Set Record

There is a chance that Superior Oil Company and Union Oil Company's joint deep test in Ten Section area in Kern County will establish a new world's record for depth. This hole, known as Kern County Land Co. 8, Section 11-30-26, has reached 12,559 feet, with 7-inch casing at 10,380 feet. This is the deepest hole ever drilled in California, and second deepest in the world.

Another deep test at Dominguez being watched rather closely is Union Oil Company's Callender 50, bottomed at 10,435 feet, with 6⅝-inch landed at 10,050 feet. It has been necessary to recement the last string the third time in an effort to shut off water. It is now understood the zone open will be tested in a few days, even if it does continue wet. Evidently Shell Oil Company feels sure there is an oil sand around 10,000 feet in this field, as the company has carried its Reyes 90 to 9598 feet. The test is fishing for drill pipe.

Union Oil Company's deep test at Santa Fe Springs, bottomed at 10,789 feet, is still fishing for frozen drill pipe.

Best In Months

In the north Belridge field in Kern County, Belridge Oil Company's Belridge 1-21, Section 1-28-20, was the best completion in California for some time. This hole is bottomed at 8473 feet, with 9-inch cemented at 7925 feet. It started flowing 4500 barrels of 32 gravity clean oil, in addition to 300,000 cubic feet of gas. Tubing pressure was 180 pounds, with 500 pounds on the casing. The flow is through 470 feet of 4¾-inch, perforated. Two 96/64-inch chokes are being used. Six other holes are drilling at Belridge, and at least two are due for early completion.

The Kettleman Hills deep test, Kettleman North Dome Association's No. 1-18—, is drilling slightl ybelow 10,300 feet in hard shale. Last casing was 9⅝-inch, cemented at 8387 feet. Thirteen holes are now drilling at Kettleman Hills, north dome, all below 6000 feet except two. Two other new holes are almost ready to spud.

The number of drilling wells at Ventura Avenue also is 13. There are two rigs up and two locations already staked. This is a deep hole field, and practically all wells are completed below 8500 feet, some deeper than 9000 feet. Tide Water Associated's Lloyd 137 is drilling ahead in shale and oil sand below 7183 feet with 13⅜-inch casing cemented at 5980 feet.

Large El Segundo Completion

El Segundo field in Los Angeles County, near the large Standard Oil Company of California refinery, is

CALIFORNIA Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
EL SEGUNDO—		
Richfield Oil Corp., El Segundo 5..	1010	7513
HUNTINGTON BEACH—		
Holly Oil Co., No. 7-A.....	90	4059
WILMINGTON—		
Godsford Oil Co., Wilmington 1.....	425	3632
Royalty Service Co., Nelson A-3....	450	3550
Nelson A-4	1015	3541
16-7, No. 1.....	720	3609
20-5, No. 1	405	3557
23-7, No. 1.....	500	3609
F. C. Hall, 20-7, No. 2.....	410	3100
BELRIDGE—		
Belridge Oil Co., Belridge 1-21.....4500		8473
FRUITVALE—		
Western Gulf, Sawyer-Reed 3.....	800	3442
KERN FRONT—		
Barnhart-Morrow Cons., K.C.L. 3..	125	1962
Italo Pet. Corp., Cauley 36.....	125	2913
KETTLEMAN HILLS—		
Kettleman No. Dome Assn., No 63-34J	2560	7865
Standard Oil Co., No. 38-33J.....	390	7975
MIDWAY SUNSET—		
Linderman Corp., No. 1.....	150	3135
Mid-Crude Pet. Co., No. 2.....	100	1940
Standard Oil Co., No. 124-33D....	550	2905
Standard Oil Co., No. 125-33D....	270	2720
Texas Co., Midway 20	260	2944
No. 21	160	2870
MOUNT POSO—		
Shell Oil Co., Vedder-Rall 12.....	260	1790
EL CAPITAN—		
Shell Oil Co., Covarubias 1-21.....	125	2655
KERN COUNTY—		
Doyle Pet. Co., Quinn 2.....	*	2922
Superior-A. T. Jergins, Crome Com 1	*	5235
Reserve Oil & Gas Co., No. 2-6....	*	2686

*Failures; †Junked; ¶Million cu. ft. gas.

ACIDIZING HAND BOOK

By BENSON M. KINGSTON

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found to be spotted, and deep. Richfield Corporation's No. 5 recently was completed at 7513 feet for 1150 barrels of 28.3 gravity oil with 2,560,000 cubic feet of gas. A string of 8⅝-inch is cemented at 7439 feet, the flow coming through 77 feet of 6⅝-inch, perforated. This is the largest well completed in this new field since The Texas Company's Security 1 came in from 7253 feet March 24 for 3720 barrels of oil. This big well is still flowing a daily rate of 2231 barrels, 60 days after completion. Seven wells are drilling in the field. Four new holes will start next week.

Barnsdall Oil Company has cleaned out and restored to production Rancho San Francisco 1 near Newhall. It is flowing 200 barrels of 36.8 gravity clean oil, accompanied by 50,000 cubic feet of gas following a shot. This hole is the discovery well for a field yet to be named. It has a depth of 6472 feet, with 8⅝-inch cemented at 6160 feet. Barnsdall has made location for No. 2. The company holds under lease a large block, though practically every acre within five miles of the new well has been leased by various concerns.

Cantua Creek Discovery

Western Gulf Oil Company has discovered a new field in the Cantua Creek area in Fresno County, but it is possible the discovery well will have to be abandoned and a new hole drilled. Southern Pacific Land Co. 3, with bottom at 8531 feet, and a plug landed at 6950 feet, on a swabbing test made 135 barrels of 35.2 gravity oil and 128 barrels of water in 17 hours. The company may redrill this zone, or it may drill a new well.

At Devil's Den in Kern County, Den Petroleum Company's Bates 1, Section 20-25-19, cored 18 feet of good-looking oil sand from 4220 to 4238 feet, but the company has decided to take a few more cores before setting pipe, preparatory to a production test. The Devil's Den area has been the scene of a number of wildcat tests during the past few years, and while several of the tests found some oil sand at various depths, the area has not been properly proven as a new oil field. It is barely possible this present test will do the job.

Union Oil Company has blocked up rather extensive acreage in the McGunden area of Kern County and is expected to start a wildcat about 1½ miles south of Superior Oil Company and A. T. Jergins Trust's Crome Community 1, which is in Section 36-29-28.

May question California's title to offshore lands

Washington, D. C.—Indications that the government may move to test validity of California's claim to title to oil lands laying off the shore of the state were seen here this week in statements by Attorney General Cummings, at a press conference, that the newspapers may get the gist of the department's findings in the near future.

The attorney general refused to go further into the matter, but did indicate he planned no report to Senator Nye of North Dakota, who has a bill pending in Congress dealing with the subject, the inference being that the news would "break" in California.

EASTERN FIELDS

Pure completes 100-barrel well in Illinois.

* * *

Start 3000-foot wildcat in south central Kentucky.

Pittsburgh. — Fair producers completed in Illinois, Ohio, and Pennsylvania, and spudding in of an important test in the Center oil territory of South Central Kentucky highlighted Eastern fields operations last week.

Pure Oil Company reported completion of Bradley No. 1, SW SW NW Section 26-1n-7e, Patoka Township, Marion County, with an initial production of 100 barrels daily. This test found McCloskey sand of Lower Mississipian at 2982 feet, and was bottomed at 2987 feet. Pure's Billington No. 1, offset to Bradley 1 and in SE NE NE Section 27-1n-73, same township, failed to find the McCloskey and will be drilled deeper. Now drilling below 3300 feet, it topped the St. Genevieve at 3040 feet.

Drilling in 30 Counties

Activity in Illinois fields continues on the increase, with operations started in over 30 counties. Most drilling is in the Centra Basin area, with the Patoka field of Marion County the hub.

Pure Oil Company completed Amy F. Nethers 5 in Hanover Township, Licking County, Southeastern Ohio. Bottomed at 3264 feet, it produced 105 barrels the first day after a shot.

Carnegie Natural Gas Company brought in the second fair Washington County, Pennsylvania, producer in as many weeks on the Dr. C. T. Dodd farm as a 200-barrel producer in the Fifth sand, bottomed at 3038 feet. It is the second well on this tract. Last week, this operator completed a 300-barrel well on the Alberta Iams tract. Both are in South Franklin Township.

Test Begins in Center Area

George Skaggs, drilling for a group of Chicago doctors, started a deep test in the Center oil territory of south central Kentucky about 18 miles northeast of Glasgow. The test will seek a new oil level and will be drilled to 3000 feet if necessary; 1000 feet deeper than any well previously drilled in this territory. Salt water has been found in nearly all oil wells heretofore drilled in this vicinity and the new test will go past the salt water level. Skaggs plans to make careful examinations every few feet beyond the 2000-foot level.

Nineteen wells were completed in Kentucky fields during the week, of which four were producers having a total initial production of 145 barrels, nine were gas wells, and six were failures. Largest producer was that of Carpenter et al on the William Hardin Heirs tract, in the Hardin pool of Ohio and McLean Counties. It yielded 75 barrels from the Jett sand, bottomed at 1149 feet. Ohio continues as the most active of Kentucky counties, accounting for five more of the week's completed operations: New Deal Oil & Gas Company has a 40-barrel producer in O'Dell Heirs 9, Dundee District, producing from the Jackson sand; Snowden & McSweeney have a 15-barrel well in Howard Heirs 25 in Ralph District, while failures were recorded by Interstate Oil & Gas Company with Sam Gaines 2, Fordsville District, Chester Oil Company with John McCarthy 2, Friendship Church District, and W. E. Hupp with S. H. Easton 7, Adaburg District.

East Central Kentucky Busy

In Wolfe County, east central Kentucky, activity is increasing: Charley Brown and other are moving in on the James Booth Heirs tract; Leebern Allen and others are preparing to sink a test well on Pages Branch, about a mile northwest of Campton and near the old E. F. Duff well which has been abandoned for over five years; James I. Hollon & Company are drilling below 2000 feet on the Trace fork of Stillwater, three miles east of Campton, and are preparing to go to 5000 feet, while Claude Townsend is planning to repressure wells on the old Beckett Isman lease recently purchased from Lincoln Oil Company and may drill some new wells.

In Gallia County, Ohio, Southern Ohio Development Company's test on the John Myers property drilled to 3018 feet and was plugged back to the Gordon sand at 1455-68 feet, where it gauged 100,000 feet of gas after a shot of 40 quarts. This test was reported abandoned two months ago.

Twenty completions were reported in Ohio fields, of which eight were oil wells having a total initial production of 141 barrels, seven were gas wells and five were failures.

In the Oriskany deep sand gas field of Kanawha County, Kentucky, West Virginia Gas Corporation reported a completion on the V. L. Burdette tract, Poca district, gauging 7,000,000 cubic feet a day and bottomed at 4871 feet. Several new locations were staked in this field.

McCall Drilling Company completed the largest West Virginia well on the

Lloyd F. Wolf tract, Independent District, Gilmer County. It gauged 12,000,000 cubic feet of gas.

West Virginia completions totaled 13, of which two were producers having a total initial production of 15 barrels, nine were gas wells and two were failures.

EASTERN FIELDS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
OHIO		
ATHENS COUNTY—		
Albany Gas Co., Ray Bailes 1	*	465
D. T. Orndoff, Emmett Linscott 1	*	1450
GALLIA COUNTY—		
Southern Ohio Development Co., John Myers 1	¶	3018
HOLMES COUNTY—		
Ohio Fuel Gas Co., George Lay 1	¶	3384
KNOX COUNTY—		
Sterl Brown & Co., Alfred Rine 3	2	706
LICKING COUNTY—		
Pure Oil Co., Benson Nethers 5	105	3264
Allen Willey et al, Curry & Caldwell 1	25	2985
Bishop & Patton, Jane Hirst 7	3	742
MEDINA COUNTY—		
Curtis & Eaken, Thomas Brown Jr. 18	1	390
MEIGS COUNTY—		
Nelson & Co., Lemoine Hysell 2	¶¾	722
Roy Holmes & Co., Schuyler Bush 3	¶½	1973
Ohio Fuel Gas Co., William Curs 1	¶	2137
Fleming & Co., Nicholas Pierce 1	*	817
MORGAN COUNTY—		
Burt & Son, Susan Minor 9	3	490
Cumberland Oil Co., H. Hopkins 40	1	450
G. E. Morris et al, W. E. & Daisy L. Harker 2	1	496
SUMMIT COUNTY—		
East Ohio Gas Co., J. Reifsnyder 1	¶1	4212
WASHINGTON COUNTY—		
Best Run Oil & Gas Co., Anthony Schwartz 2	¶	980
McVey Oil & Gas Co., John Arnold 1	*	1700
J. C. Herlan & Co., John Eddy 2	*	973
WEST VIRGINIA		
BOONE COUNTY—		
Owens-Illinois Glass Co., Ida White 1	¶1	1735
CABEL COUNTY—		
Smith Creek Gas Co., et al, Joseph Childers 1	¶	3805
W. C. Kingery et al, H. O. Aleshire 1	¶1	2967
CALHOUN COUNTY—		
Gerald D. Jones, H. H. Bennington 1	12	2197
CLAY COUNTY—		
Hope Natural Gas Co., Mary Wetherall 7766	¶	2546
GILMER COUNTY—		
McCall Drilling Co., Lloyd F. Wolf 1	¶12	1439
Pittsburgh & West Virginia Gas Co., G. E. King 1	¶½	1552
KANAWHA COUNTY—		
West Virginia Gas Corp., V. L. Burdette 1	¶7	4871
RITCHIE COUNTY—		
National Compressor Co., John Lynch 4	3	2017
W. D. Gribble, Leonard Heirs 4	¶	1813
South Penn Oil Co., Haught Lambert 20	¶	2119
W. H. Mosser, H. W. Britton 1	*	1878
WOOD COUNTY—		
L. C. Powell et al, Cyrus Pugh	*	873
PENNSYLVANIA		
BUTLER COUNTY—		
American Natural Gas Co. & T. W. Phillips Gas & Oil Co., Perry S. Davis 1	*	
GREENE COUNTY—		
Union Gasoline & Oil Corp., Lloyd & Mary Strope 7	5	3450
WASHINGTON COUNTY—		
Carnegie Natural Gas Co., Dr. C. T. Dodd 2	200	3038
ILLINOIS		
MARION COUNTY—		
Pure Oil Co., Bradley 1	100	2987
Hempen & Burgess, G. E. Allison 1	*	1495

MICHIGAN FIELDS

Billings test opens new area southeast of Buckeye.

Mt. Pleasant.—Twenty-one of the 31 completions in Michigan for the week were registered in Buckeye field, Gladwin County. Pray and Caldwell's Flynn 1, SW SW NW, Section 4-17n-1e, Billings Township, was rated as the most important development.

The Billings Township test, following a 2000-gallon acid treatment, was producing between 350 and 450 barrels daily from Dundee lime. It opens new territory southeast of the original Buckeye play for immediate development.

Mammoth Producing and Refining Company's Manyette 1, Section 3-18n-1w, Buckeye Township, a mile northwest extension to the north-Buckeye area, is producing an average of 125 barrels after acid. This test probably will bring Sun Oil Company into the Buckeye play heavier than ever. Sun has 600 or more acres in the immediate area of Manyette 1.

Other Gladwin County completions, while helping to flood the badly saturated Michigan crude market, were in proven territory and not important from the standpoint of new acreage in the field.

The Buckeye proration committee in its newest move to bring production in line with the market, set the allowable at a 150-barrel well base, with a 10 percent overage depending on pipe line withdrawals. The committee set the pool's potential daily output at 68,000 barrels. Markets for the crude are under 20,000 barrels daily.

Company, Well and Location	Init. Prod. Bbls.	Depth
KENTUCKY		
DAVIESS COUNTY—		
H. A. Henry et al, Miller Taylor	*	1004
FLOYD COUNTY—		
Fred Williams, Woods 1	¶2	1512
Stanley Heirs 5	¶	2794
Inland Gas Co., Harve Spears 179	*	225
HENDERSON COUNTY—		
Jay Petroleum Co., J. T. Bond Jr. 2	15	....
KNOTT COUNTY—		
Inland Gas Co., S. B. Webb 185	¶1	1964
R. C. Kilgore 1	¶½	2909
Son Hall, H. H. Smith 1	¶	....
McLEAN COUNTY—		
J. C. Miller et al, James Snyder	*	630
MARTIN COUNTY—		
Warfield Natural Gas Co., M. B. Collingsworth 4703	¶½	2967
S. Robinson 4716	¶	2701
M. Maynard 4714	¶½	2798
J. E. Cassaday 4726	¶	2749
OHIO COUNTY—		
Carpenter et al, Wm. Hardin Heirs 4	75	1149
Interstate Oil Gas Co., Sam Gaines 2	*	242
New Deal Oil & Gas Co., O'Dell Heirs 9	40	....
Snowden McSweeney, Howard Heirs 25	15	....
Chester Oil Co., John McCarthy 2	*	825
W. E. Hupp, S. H. Easton 7	*	....

*Failures; †Junked; ¶Million cu. ft. gas.

MICHIGAN

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ALLEGAN COUNTY—		
Muskegon Oil Corp.'s Moomey 1, se nw se 17-4n-13w	270	1590
ARENAC COUNTY—		
Hal Be Oyle's Bergeron 1, ne sw ne 15-20n-4e	¶½	1265
GLADWIN COUNTY—		
Wicklund Dev. Co.'s State B-2, se sw ne 11-18n-1w	960	3631
State D 1, nw nw ne 11-18n-1w	690	3626
State C 2, se sw nw 12-18n-1w	285	3630
Mammoth Prod. & Ref.'s Manyet 1, se ne sw 3-18n-1w	380	3694
State A 4, se ne nw 14-18n-1w	1770	3630
Daily Crude Oil Co.'s Jakab 2, nw sw se 10-18n-1w	325	3656
Sun Oil Co.'s Ockerman 1, se nw se 10-18n-1w	600	3655
Raab 1, ne se ne 10-18n-1w	965	3658
Salla 5, ne nw sw 11-18n-1w	1750	3619
Smith Pet. Co.'s Reed 1, sw se ne 11-18n-1w	900	3625
Brenner 1, nw se nw 14-18n-1w	150	3642
Brenner 2, ne se nw 14-18n-1w	600	3646
Buckwin Oil Co.'s State 1, se nw se 11-18n-1w	990	3630
State 4, ne nw se 11-18n-1w	1550	3629
Socony-Vacuum's Dalley 1, sw se nw 12-18n-1w	480	3636
Rex Oil Co.'s McKinney 1, nw nw ne 13-18n-1w	120	3624
Double K Trust's State B1, nw ne ne 14-18n-1w	1750	3640
E. S. Beaver's State B2, ne ne ne 14-18n-1w	2600	3650
Clark & Johnson's McMahon 3, nw nw sw 36-18n-1w	1560	3574
Hanner Oil Co.'s Armstrong 1, ne ne sw 23-18n-1w	130	3602
Pray & Caldwell's Flynn 1, sw sw nw 4-17n-1e	145	3614
ISABELLA COUNTY—		
Gulf Ref. Co.'s Koch 1, nw ne nw 1-13n-4w	*	3735
Pure Oil Co.'s Latham 2, nw nw se 33-15n-6w	250	3643
Rowmor Corp.'s Leiter 2, se ne sw 33-15n-6w	300	3649
MIDLAND COUNTY—		
M. L. Jorgensen's Cassidy 1, w e nw 16-14n-2w	45	3570
Merchant Oil Co.'s Iosco 1, e w nw 16-14n-2w	75	3590
Pure Oil Co.'s Kneeland A1, n nw se 11-13n-2w	*	3483
MONTCALM COUNTY—		
Wolverine Gas Co.'s Lambert 2, c sw nw 11-12n-7w	¶60	1251
MUSKEGON COUNTY—		
West Mich Consumer's Baker 1, c ne 6-9n-14w	¶½	1158

*Failures; †Junked; ¶Million cu. ft. gas.

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IMPORTANT WILDCAT TESTS

ARKANSAS

ASHLEY COUNTY—Joe Modisett & Phillips Pet. Co.'s Stillions Lbr. Co. 1, s½ sw nw 18-17-9, rog.

CLARK COUNTY—McLarry et al's Bierne Lbr. Co. 1, ne se ne 22-10s-21w, woc 103 ft. Carter & Burdick's Ozan Lbr. Co. 1, ne nw 25-9-19, elev 226 ft, sd 1525 ft. M. W. Martin's C. L. Cabe 1, nw nw 14-10-20, sd 1002 ft shale, install heavier rig.

CLEVELAND COUNTY — Texas-Canadian Dev. Co., Inc.'s I. E. Moore Est. 1, ne ne 22-9-10 rur.

COLUMBIA COUNTY—Robt. Keen's Runyon 1, 1-16-21, dk.

DALLAS COUNTY—J. C. Voyles et al's Sorrells 1, se se sw 35-10-16, mim.

HEMPSTEAD COUNTY—Easton, May & Murdock's LaGrone 1, ne ne 5-12-26, rur. E. H. Moore, Inc.'s Porterfield 1, ne se 21-14-25, elev 346 ft, chalk 1275-1650 ft, dr 1886 ft.

LA FAYETTE COUNTY—E. H. Moore, Inc.'s DeLay 1, 15-15-24, mim. A. M. Neely's Meek 1, ne nw 35-19-25, sd 3609 ft.

LINCOLN COUNTY—Fitzwater et al's V. Bowens 1, nw sw ne 26-9-6, rur.

LITTLE RIVER COUNTY—J. G. Strahan's Dierks Lbr. Co. 1, 21-12-28, top red beds 1130 ft, top anhydrite 1804 ft, sdtr, old td 2330 ft.

LONOKE COUNTY — Frank F. Silver's Chambers Est. 2, ne nw 17-2n-7w, dr 1025 ft shale.

MILLER COUNTY—W. L. McClanahan et al's Capps 1, ne sw 11-20-28, elev 284 ft, chalk 2040-2552 ft, coring 4775 ft. E. H. Moore, Inc.'s Dale 2, c e½ 24-15-26, elev 250 ft, coring 4558 ft. Standard of La.'s Sarah Harvey 1, sw sw sw 33-16-26, rur (9000 ft test).

NEVADA COUNTY—Benedum & Trees Oil Co.'s Grove 1, se nw 10-14-20, tested 2100 ft sw in 2 hours 4277-4317 ft, coring 4338 ft. S. F. Sheppard's Purifoy 1, 17-11-20, sd 583 ft. A. M. Lacey's Bennett 1, 28-14-22, lcn abn. Bruce Wallace's Haynie 3, se nw 6-14-20, rur.

OUACHITA COUNTY — Copenhaver Oil Corp.'s J. E. Exans 1, nw ne sw 20-11-19, rur. H. H. Taylor's Joe McCree 1, nw sw nw 21-13-19, elev 272 ft, top chalk 1529 ft, dr 2220 ft shale.

UNION COUNTY—Alice Sidney Oil Co.'s Morgan 1, ne se 18-18-17, dr 5335 ft. H. C. Detrick's S. L. Robbins 1, 12-19-16, woc 16-in csg 30 ft. Lion OR Co.'s Edna Morgan B-1, sw nw se 18-18-17, elev 245 ft, top red beds 3150 ft, cored 12 ft saturation, arr make drill stem test, td 5571 ft. Marine Oil Co.'s M. Justiss 1, swc lot 7, nw 18-18-17, elev 259 ft, csg set on bottom at 5660 ft, arr perf csg and test. W. D. Wingfield's Southern Kraft Corp. 1, sw ne 18-16-14, elev 124 ft, top Nacatosh 1982 ft, dr 2770 ft.

CALIFORNIA

FRESNO COUNTY

CANTUA CREEK—Western Gulf's S.P.L. 3, 3-17-15, td 8561 ft, plug 6950 ft, cemented through perforations 6330 to 6340 ft, swabbed and sanded up, co, swabbed 135 bbls of 35.2 gravity oil in 17 hours, and 128 bbls water, may decide to drill new well, since this well proved production in Temblor.

KERN COUNTY

DEVIL'S DEN—Amerada Pet. Corp.'s Beer 4, 17-26-19, dr sandy shale 395 ft. Den Pet. Co.'s Bates 1, 20-25-19, dr shale 4241 ft. Geo. Goodrum's Baron 1, 24-25-18, td 320 ft, rep equip.

LERDO—Arkelo Pet. Co.'s Arkelo 41, 23-28-26, td 10,056 ft, fsh dr pipe.

BENA—Bacal Oil Corp.'s No. 1, 5-30-30, rig. Cajalco Pet. Co.'s Brown-Pallette 1, 9-30-30, dr shale and gray sand 1441 ft.

ROUND MOUNTAIN—Big McKittrick Oil Co.'s No. 1, 4-28-29, bldg rig.

PREMIER—Bojaki Oil Co.'s Bowen 1, 28-27-27, sd 1959 ft.

GRAPEVINE—Buffalo Oil Co.'s Tejon 1, 5-10-19, sd 4452 ft. Ohio Oil Co.'s Title Ins. D-1, 21-11-19, dr shale 8556 ft. Reserve Oil & Gas Co.'s No. 2-6, 2-10-19, td 2686 ft in shale, aban; Ritchie 33-1, 33-11-19, td 6030 ft, plug 4990 ft, sd; Tejon 33-2, td 4505 ft, redr to 4476 ft, sd; Tejon 33-3, td 4431 ft, gas well, shut in; Tejon 33-4, dr shale 3836 ft.

KERN FRONT—C.C.M. Oil Co.'s Carter 1, 7-27-27, dr shale 1918 ft.

WASCO—Continental Oil Co.'s K.C.L. B-1, 8-27-24, sd 9591 ft; No. 2, same sec., bldg rig. Seaboard Oil Co.-Tide Water Associated's Continental-K.C.L. C-1, 26-27-24, td 9148 ft, coring, showing on ditch.

ROSEDALE—Continental Oil Co.'s K.C.L. B-1, 12-29-26, dr shale 8290 ft, no showings.

JASMINE—Doyle Pet. Co.'s Quinn 1, 15-25-27, td 2956 ft, bailing; No. 2, 15-25-27, td 2922 ft, abn.

EDISON—East Edison Oil Co.'s No. 1, 23-30-30, sd 1150 ft.

ELK HILLS—Elk Hills Pet. Co.'s No. 1, 14-31-28, sd 7580 ft.

CARRIZO PLAINS—Eocene Oil Co.'s No. 1, 31-31-22, lcn.

ARVIN—General Pet. Corp.'s Arvin 1, 26-31-29, td 7462 ft, plug 7215 ft, pumping 60 bbls 32.8 gravity oil, cut 36 percent.

NORTH KERN RIVER—Hub Oil Co.'s No. 1, 8-28-28, dr shale 3322 ft.

STRAND—Ohio Oil Co.'s KCL E2, 6-30-26, dr shale 5500 ft.

TEN SECTION—Shell Oil Co.'s Canal 21-14, 14-30-25, dr shale 8091 ft. Superior Oil Co.-Union Oil Co.'s KCL 8, 11-30-26, dr sandy shale 12,350 ft, last casing 7 in at 10,380 ft, coring every foot of hole.

WEST MOUNTAIN VIEW — Sunset Oil Co.'s Sunset-Starr 1, 17-30-28, dr sandy shale 5720 ft.

McGUNDEN—Superior Oil Co.-A. T. Jergins Trust's Crome Com. 1., 36-29-28, td 5235 ft, plug 3178 ft, to recover 9 in and abn.

SOUTH MARICOPA—Trans-Line Pet. Corp's No. 1, 3-10-23, sd 662 ft.

SAN EMIDIO—Union Oil Co.'s No. 3-C, 33-11-22, dr shale 2568 ft.

RIO BRAVO—Union Oil Co.'s Kerncoe 1-34, 34-28-25, dr brown shale 8180 ft.

MIDWAY SUNSET—Valley Oil Co.'s No. 1, 18-32-23, sd 2870 ft.

BAKERSFIELD—Wilshire Oil Co.'s F & P 1, 36-29-27, dr sandy shale 3400 ft.

MISCELLANEOUS

HUMBOLDT COUNTY — Bushnell Oil Corp.'s Daisy Cook 1, 28-1-2, no report. Texas Co.'s Eureka 2, 22-3-1, td 7697 ft, ran 900 ft 6⅝ in liner, standing cemented at 7395 ft.

KINGS COUNTY — Birch-Royer Oil Co.'s Wm. Orr 1, 5-23-17, rur. Central Calif. Utilities' Kettleman-Lakeview 3, 11-23-19, td 1202 ft, plug 1190 ft, sd. Dudley Ridge Dev. Co.'s No. 2, 24-23-20, dr shale 274 ft. Kettleman View Oil & Gas Co.'s No. 1, 9-22-19, td 4787 ft, wocs 6⅝ in at 3400 ft. Glen C. Stone's Teeter 1, 25-20-20, td 1040 ft, bailing. Tri-Counties Oil Co.'s Olson 1, 10-23-22, td 4300 ft, wocs 7 in at about 4300 ft.

SAN BENITO COUNTY—Tide Water Associated's Murphy Ranch 1, 5-12-4, td 6921 ft, set 6⅝ in at 6800 ft, tested wet, to recement through perforations at 5980 ft.

SAN JOAQUIN COUNTY — Standard Oil Co.'s McDonald Farms 3, 24-2-4, td 5339 ft, shut in; Woods Com. 1, 24-1-5, rur.

SOLANO COUNTY — Amerada Pet. Co.'s Marks 1, 24-4-2, dr sand 4465 ft, landed 7 in at 4135 ft; No. 2, 22-4-2, rig.

STANISLAUS COUNTY—No. K-2-1, 30-4-9, dr shale 600 ft.

SUTTER COUNTY—Buttes Oilfields' No. 4, 2-15-1, td 5800 ft, fsh dr pipe.

TULARE COUNTY—E. P. Jennings' No. 1, 4-24-23, td 2707 ft, plug 2309 ft; No. 2, idle. Trico Oil & Gas Co.'s Valley 1, 36-21-25, rig.

MONTEREY COUNTY—Amil A. Anderson's No. 1, 15-24-14, dr shale 1007 ft. Shell Oil Co.'s Branch 2, 34-24-10, dr shale 8574 ft.

SAN LUIS OBISPO COUNTY—Aviation Oil Co.'s Britnall 1, 10-11-35, td 1930 ft, redr to 1200 ft, sd. Barnsdall Oil Co.'s KCL A-1, 1-22-20, td 5220 ft, fsh dr pipe. I. L. Burch's No. 1, 3-10-25, sd 3209 ft. Burkholder Oil Corp.'s Clay 1, 14-10-26, sd 3252 ft. Gretna Corp.'s Miano 1, 25-30-10, td 1040 ft. A. O. Lewis' Pecho 1, 34-30-10, td 2600 ft, formerly Painted Hill Oil Co., to dr ahead. Pismo Pet. Co.'s No. 1, 5-32-13, td 4475 ft, junk in hole, sd. Temblor Oil Co.'s No. 1, 22-31-21, dr gray sand 1491 ft. Oscar Willett's No. 1, 27-26-13, ready to spud.

SANTA BARBARA COUNTY—E. E. Arnold's Arnold-Apache 2, 8-8-33, dr brown shale 2461 ft. Cohn & Mitchell's Giacomiani 1, 18-10-34, td 1934 ft, r to set pipe, spudded May 13. Hancock Oil Co.'s Los Almos 2, 6-7-32, foundation. Leora Oil Co.'s Fithian 1, 8-4-25, sd. Murdock & Allen's No. 1, 16-7-30, material on lcn. Nine Springs Oil Co.'s Brinkinhoff 1, 9-7-30, td 330 ft, wocs 8⅝ in at 2750 ft. Oatman Rainbow Gold Mining Co.'s Mid-West 1, 28-4-27, dr shale 1710 ft. Pacific Western's Hobbs 1, 21-10-34, rig. S. E. D. Oil Co.'s No. 1, 27-10-34, rur. Tide Water Associated's Leonis 1, 3-6-33, cellar. Union Oil Co.'s Russell 1, 21-10-34, dr shale 2580 ft, landed 11¾ in at 2014 ft. Valley Oil Co.'s Chief 1, 20-9-34, td 2315 ft, to test on pump.

VENTURA COUNTY—Continental Oil Co.'s Casitas 1, 7-3-23, dr shale 7295 ft. El Rio Oils-Canada's El Rio 1, 6-1-21, near Oxnard, ran formation tester, recovered muddy water, and a little heavy oil, at 2780 ft, now coring ahead. Speik Oil Co.'s Speik 1, 35-5-19, td 2430 ft, r. Giovanni Vai's Scott 1, 4-4-21, dr shale 225 ft.

SOUTHERN CALIFORNIA

NEWHALL—Barnsdall Oil Co.'s Rancho San Francisco 1, 26-4-17, td 6472 ft, recompleted for 200 bbls 36.8 gravity oil, after co; No. 2, lcn. Holbrook Pet. Co.'s Newhall Land 1, 28-4-16, td 5365 ft, fsh.

PICO CANYON—A. G. Burt's No. 1, 36-4-17, dr shale 1560 ft.

LYNWOOD—Calizoo Oil Co.'s Saulque 1, 9-3-13, dr shale and sand 4800 ft.

NORTH LONG BEACH—Geo. L. Clayton's Clayton 1, 32-3-12, sd 4895 ft.

FOX HILLS—Country Club Oil Co.'s No. 1, 19-2-14, sd 3020 ft.

HERMOSA BEACH — C. M. Henderson's No. 1, td 2804 ft, fsh.

DAVIDSON CITY—Hilldon Oil Co.'s Flood Control 1, 11-4-13, td 6105 ft, plug 5750 ft, sd.

WEST COYOTE — Hogan Pet. Co.'s McNally 1, 23-3-11, dr hard gray shale 6050 ft.

WALNUT—Julian & Criswell's Langstaff 1, 5-2-9, td 1805 ft, co.

PALOS VERDES HILLS—McClaren Bros.' No. 1, 27-4-14, td 3970 ft, redr to 1870 ft, bailing.

ORANGE COUNTY—Mesa Oil Co.'s Mesa 1, 29-6-10, dr hard shale 7560 ft. Richfield Cons. Oil Co.'s Todd 1, 22-3-9, spud May 16, dr. Signet Oil Co.'s Signet 1, 21-3-9, td 750 ft, rep machinery. West American Oil Co.'s Irvine 1, 14-5-9, dr sand and shale 3350 ft.

KANSAS

BARBER COUNTY — Pryor & Lockhart's Gant 1, cse¼ 7-31s-13w, woc 621 ft. Barbara Oil Co.'s Holmes 1-27, cnw nw 27-33s-13w, rur.

BARTON COUNTY—C. L. Price et al's Kraft 1, sw nw ne 10-17s-11w, testing. C. L. Carlock's Leibel 1, se ne se 18-18s-11w, td 3469 ft, D & A. Geo. Dickey et al's Boger 1, se se ne 15-16s-13w, dr 3125 ft. C. L. Carlock's Ehly 1, ne ne se 5-18s-11w, td 3397½ ft, pb 3368 ft, 300 A; D & A. C. H. Weaver's Stumps 1, ne ne ne 3-17s-12w, td 3383 ft, D & A. Wakefield et al's Scheurermann 1, ne ne sw 31-16s-15w, dr 3510 ft. Stanolind O&G Co.'s Struder 1, se se sw 26-16s-13w, cor 3218 ft. Stanolind's Meggars 1, sw sw sw 21-20s-11w,

ABBREVIATIONS

The following abbreviations, signs, etc., are used in completions and wildcat reports in THE OIL WEEKLY.

*—*dry hole abandoned well.*	owdd—*old well drilling deeper*
‡—*salt water (completions).*	owpb—*old well plugging back.*
†—*junked and abandoned.*	pb—*plugged back or plugging back.*
¶—*million feet of gas.*	r—*reaming.*
abd—*abondoned.*	rog—*rig on the ground.*
bbls—*barrels.*	rur—*rigging up rotary tools.*
br—*building rig.*	rust—*rigging up standard tools.*
b.s.—*basic sediment.*	sd—*shut down.*
csg—*casing.*	sdtr—*sidetracking.*
co—*cleaning out.*	sg—*show gas.*
dd—*drilling deeper.*	si—*shut in.*
dk—*derrick.*	so—*show oil.*
dr—*drilling.*	so&g—*show oil and gas.*
fsg—*fishing.*	spd—*spudding.*
ft—*feet.*	sr—*straight reaming.*
hfw—*hole full of water.*	sw—*salt water.*
in—*inches.*	td—*total depth.*
lcn—*location.*	ur—*underreaming.*
m—*milling.*	wih—*water in the hole.*
mim—*moving in materials.*	wo—*workover.*
mit—*moving in tools.*	wocs—*waiting on cement to set.*
mot—*milling on tools.*	wosr—*waiting on standard rig.*
n, s, e, w—*north, south, east, west.*	
oih—*oil in hole.*	

td 3373 ft, D & A. Continental Oil Co.'s Lamatsch 1, sw ne ne 26-17s-12w, td 3405 ft, D & A. Magnolia Pet. Co.'s Zink 1, nw nw se 13-18s-11w, dr 3302 ft. Republic Nat. Gas Co. and Continental's Moeder 1, ne ne sw 25-17s-13w, sd 1060 ft. Stanolind and I.T.I.O. Co.'s National Bank 1, se se sw 36-16s-13w, lcn. Sam Murphy's Beck 1, ne ne ne 17-17s-12w, rig. Hanna's Luce 1, sw sw sw 21-20s-13w, rur.

BUTLER COUNTY — Vickers Pet. Co.'s Voth 1, cnl s½ sw ne 32-24s-4e, dr 3014 ft. Simpson Oil et al's Dennis 1-A, ne ne sw 15-26s-6e, dr 490 ft. Maurer & Saco Oil Co.'s Connell 1, ne ne sw 27-29s-5e, ru. Kahn et al's Madden 1-A, sw sw ne 27-23s-4e, td 2225 ft, P. 20 bbls oil and 60 bbls water, 24 hrs, 4000 gal A; testing.

CHASE COUNTY—Propp et al's Fromm 1, se se se 29-18s-9e, dr 2735 ft.

CHAUTAUQUA COUNTY—E. I. Shaffer's Nuckalls 1, nw nw nw 12-33s-9e, dr 2428 ft. Robinson et al's Foster 1, sw sw sw 6-33s-12e, dr 1235 ft.

COWLEY COUNTY — Ryan Consolidated's Couch 1, sw sw se 13-30s-5e, testing. Elmer Ash et al's Bolack 1, nw nw se 22-32s-6e, dr 2580 ft. Bess & Gralapp et al's Wakefield 1, ne se sw 18-30s-6e, dr 2886 ft. Murta & Wilson's Turner 1, ne ne nw 30-32s-6e, ur 10-in csg 1648 ft. Blair, Continental & McKnab's Miller 1, ne nw sw 14-32s-5e, dr 435 ft. Tulsa Oil et al's Dillon 1, nw nw ne 28-34s-3e, rig. McCoy, Amerada & Wentz's Anderson 1, se nw ne 34-34s-6e, fsg 1685 ft. Tom Palmer et al's Ogroskey 1, se se nw 31-32s-5e, dr 1300 ft. J. N. Wallace's Fee 1-A, sw se se 10-33s-4e, td 1450 ft, D & A.

EDWARDS COUNTY—Royal Pet. Co. et al's Krupp 1, nw nw se 18-24s-19w, dr 4230 ft.

ELK COUNTY—Republic Nat. Gas Co.'s Glasscock 1, se ne sw 19-31s-11e, ru mach.

ELLIS COUNTY—Empire's Samuelson 1, ne ne ne 31-11s-16w, woc. Mazda Oil Co.'s Henderson 1, sw sw ne 27-11s-18w, dr 3213 ft. Noble Pet. Corp.'s O'Laughlin 1, nw nw se 13-12s-19w, wih 3493 ft, sdo. Bridgeport Mach, et al's Froelick 1, nw nw se 4-13s-16w, so 3260-65 ft. J. C. Shaffer, Inc.'s Staab 1, se se se 25-12s-18w, cor 3389 ft. Twin Drlg. Co. et al's Craig 1, ne ne se 6-11s-16w, dr 3008 ft. Ted Kors et al's Koblitz 1, se sw nw 23-12s-18w, pot, P. 250 bbls oil 24 hrs, comp. Elwell & Trees Oil Co.'s Wickham 1, sw sw ne 10-11s-19w, dr 3624 ft. Billings' Smith 1, se se nw 14-12s-16w, dr 2395 ft.

ELLSWORTH COUNTY — Orville Lee's Larkin 1, nw nw nw 15-16s-8w, dr 2275 ft. Frost et al's Dolechek 1, ne ne sw 36-14s-8w, set 5-in csg 3308 ft.

GREENWOOD COUNTY—L. C. Balwanz's Travellers Ins. Co. 1, csw sw 23-26s-10e, hfw 2000-10 ft, td, D & A. B & B Oil Co.'s Webb 1, cne se 3-26s-13e, fsg 1115 ft. Ward McGinnis et al's Hanley Estate 1, sw sw sw 25-25s-9e, fsg 1500 ft. Van Deventer et al's Bemis 1-A, ne sw se 12-28s-11e, td 1315 ft, D & A.

HAMILTON COUNTY—Barnsdall Oil Co. et al's Porter 1, sw sw ne 30-25s-41w, dr 2000 ft.

HARPER COUNTY—Carter Oil Co. et al's Seihart Estate 1, csw nw 4-34s-8w, set 6⅝-in csg 4750 ft, woc.

HARVEY COUNTY—E. J. & E. B. Shawver's Hege 1, ne ne se 26-22s-2w, sdo 3027 ft. Simpson & Noble et al's Pierce 1, sw se ne 25-22s-2w, spd. Shaffer et al's Epp 1, se se sw 15-23s-3w, rot rig.

LOGAN COUNTY—Rosespring Drlg. Co. et al's Wright 1, cse se 12-15s-35w, dr pipe stuck at 4910 ft.

MARION COUNTY—Western Kan. O&R et al's Suderman 1, se sw nw 22-20s-2e, cel.

McPHERSON COUNTY — Bradley Bros.' Barnholt 1, sw sw se 30-20s-5w, dr 2740 ft. Smith et al's Larson 1, nw nw sw 35-18s-5w, dr 2130 ft. C. E. Ash Drlg. Co.'s Broman 1, ne ne nw 19-17s-4w, rig.

MITCHELL COUNTY—Geo. Seidhoff et al's Greiss 1, sw sw se 16-8s-10w, set 6-in csg 3011 ft.

NESS COUNTY—Newton Dev. Co.'s Tenny 1, nw nw se 19-18s-25w, ur 6-in csg 4379 ft. Jones & Lane's Page Milling Co. 1, se se nw 36-18s-26w, rig.

RENO COUNTY—Clyde Pulse et al's Payne 1, sw nw ne 4-22s-7w, set 6-in csg 3243 ft. Imo O&G et al's Watkins 1, se se se 14-22s-7w, dr 1700 ft. Westgate-Greenland Oil Co.'s O'Sullivan 1, sw sw ne 24-23s-5w, td 3970 ft, D & A. Sinclair Prairie's Nett 1, nw nw se 32-26s-4w, dr 4137 ft. Carter, Continental & Empire's Bontrager 1, C-54, ce¼ ne ne 26-24s-5w, lcn.

RICE COUNTY—L. E. Douglas' Coyne 1, ne se se 24-21s-8w, td 3438 ft. John Hanna et al's Fulton 1, nw nw ne 24-19s-6w, ur 8-in csg 3142 ft. Fred Phillips et al's Hubenett 1, sw ne sw 23-20s-8w, dr 3082 ft. Union O&R Co. et al's Baker 1, sw sw ne 33-20s-6w, dr 3427 ft. Comanche Oil Co.'s Cramm 1, sw sw se 15-19s-9w, dr 1850 ft. Hipple et al's Wernett 1, ne ne nw 11-20s-6w, dr 2085 ft. Empire O&R Co.'s Bredfeldt 1, cn½ n½ sw 7-18s-9w, td 3240 ft, pot P. 267 bbls oil 24 hrs, comp. Shell Pet. Corp.'s Haxton 1-B, ne ne sw 29-18s-9w, dr 2791 ft. Stanolind O&G Co.'s Mooney 1, ne ne sw 5-19s-10w, set 10-in csg 202 ft, woc. H. V. Holland et al's Brothers 1, se se se 12-21s-7w, lcn abd. Skiles et al's Helmer 1, nw nw ne 7-19s-8w, sd 1800 ft. Witt et al's Fair 1, ne se se 4-22s-8w, set 10-in csg 1890 ft. Skiles et al's Campbell 1, se se ne 28-19s-9w, cel.

ROOKS COUNTY—Lester & Dean's Burtt 1, se se ne 29-10s-20w, fsg 3818 ft. Jones Bros. Drlg. Co.'s Wiss 1, nw nw nw 8-10s-8w, ur 6-in csg 3370 ft. Basin Oil Co.'s Baxa 1, ne ne ne 23-9s-17w, td 3630 ft. Brunson Drlg. Co. et al's Casey 1, se se ne 22-9s-16w, set 8-in csg 2430 ft. C. R. Craft et al's Ziegler 1, ne ne sw 8-10s-16w, dr 2189 ft.

RUSH COUNTY—S. A. Murphy et al's Roth 1, nw nw sw 21-16s-18w, dr by 2635 ft. Duee & Brouk's Lebsack 1, se se ne 13-16s-16w, dr 1985 ft. Westgate-Greenland Oil Co. et al's Greenwalt 1, nw nw ne 19-19s-16w, dr 2940 ft.

RUSSELL COUNTY—S. A. Murphy et al's Deines 1, se se sw 36-15s-15w, sd 3075 ft. Goldstein & Vernon O&G Co.'s Steinert Estate 1, ne se sw 34-15s-15w, dr 1590 ft. Aylward et al's Jones 1, se se ne 22-14s-13w, dr 1600 ft. Equity Gas Co.'s Harbauk 1, nw ne sw 19-13s-12w, dr 2490 ft.

SCOTT COUNTY—Olson Drlg. Co. et al's Nolan 1, nw nw ne 13-19s-33w, dr 4301 ft.

SEDGWICK COUNTY — Cameron et al's Smith 1, sw se se 13-27s-2e, pb 2388 ft. Roxanna Drlg. Co. et al's Woodman 1, sw nw sw 26-26s-1w, sd 2469 ft. E. B. Shawver's Furman 1, sw ne se 24-29s-3w, skid 15 ft n, ru.

STAFFORD COUNTY — W. P. Faulkner's Shulz 1, se se ne 6-22s-13w, ru. Rosespring Drlg. Co. et al's Gray 1, nw nw nw 11-24s-13w, rot rig.

SUMNER COUNTY—Graham et al's Dawson 1, nw nw nw 4-23s-2w, fsg 4255 ft. The Texas Co.'s Harper 1, ne sw se 9-30s-3w, set 6-in csg 4273 ft, co. Gilmac Oil Co. et al's Proud 1, sw se se 33-30s-1w, dr 3070 ft. John Burton et al's Springate 1, ne ne sw 30-33s-2e, rig.

TREGO COUNTY—W. I. Southern's Latimer 1, nw nw se 19-15s-22w, dr 3225 ft. Turner et al's Roger 1, csw¼ 3-15s-23w, cel.

WOODSON COUNTY—Katz et al's Guy 1, sw sw se 6-24s-15e, td 1643 ft, D&A. M. B. Allen's Flack 1, ne ne nw 1-26s-14e, td 1432 ft. 2,300,000 cf gas & sho wtr.

SOUTH LOUISIANA

ACADIA PARISH—Humble's Federal Land Bank 1, North Crowley prospect, 34-8s-1e, dr shale 7668 ft.

CAMERON PARISH—Humble's Bell-Hanszen 1, Hanszen prospect, 5-12s-6w, dr shale 3065 ft. Superior & Pure's State Gulf of Mexico 1, in Gulf of Mexico, 4-15s-8w, lcn.

EAST BATON ROUGE PARISH—Cavalier Oil Co.'s Elliott 1, n of Hope Villa, 3-8s-2e, ru; same operator's Jacocks 1, Port Hudson area, 62-4s-1w, running an electrical logging device 4442 ft.

IBERIA PARISH—Jefferson Lake Oil Co.'s Lake Peigneur 414, Jefferson Island dome, 12s-5e, dr shale 6012 ft. Hamil & Smith's Dave Baez 1, Patoutville area, 35-12s-7e, dr shale 2200 ft.

JEFFERSON DAVIS PARISH — Louisiana Crusaders Oil Co.'s I. Langley 1, Fenton area, 36-7s-5w, coring gas sand 7897 ft. Stanolind's Calcasieu National Bank 2-B, China prospect, 28-7s-3w, dr shale 6670 ft; same operator's Calcasieu National Bank 2, South Jennings area, 10-10s-3w, dr shale 7782 ft.

LAFOURCHE PARISH — Fohs Oil Co.'s State Long Lake 1, Bourg prospect, 65-17s-19e, coring salt water sand 8635 ft. Gulf's State 3, sw of Marchland, 36-23s-21e, dk.

PLAQUEMINES PARISH—Gulf's State Bay Adams, pp in Bay Adams, 32-19s-28e, dr shale 4650 ft. Tide Water's Manhatten Fruit 3, Venice dome, dk.

ST. BERNARD PARISH—Gulf's Lake Lery 2, Lake Lery prospect, 28-14s-14e, repairing rig 6210 ft.

ST. CHARLES PARISH — Amerada & Louisiana Land's State Bayou Des Allemands 1, Black Prince Island prospect, 13-15s-20e, dr sand 5498 ft.

ST. LANDRY PARISH—Gulf's Haas-Hirsch 1, Krotz Springs area, 12-6s-7e, ru. Shell's Boagni 1, ne of Cankton field, 48-8s-4e, dr shale 9006 ft.

ST. MARTIN PARISH—Joe E. Lilly et al's R. Martin 1, Section 28 prospect, 32-10s-7e, dr shale 3310 ft. Texas Co.'s State Mongouloi 3, Lake Mongouloi prospect, 14-10s-9e, conditioning mud 8175 ft; same operator's St. Martin Land Co. 9, Henderson area, 21-8s-7e, abn 8858 ft.

ST. MARY PARISH — Texas Co.'s State Bateman Bay 1, Morgan City prospect, 21-16s-12e, dr shale 9379 ft; same operator's State Horseshoe Bayou 1, on Horseshoe Bayou, 40-17s-9e, moving in drilling barge 12,261 ft.

TERREBONNE PARISH—Humble's Elender 1, Houma Gas field, Section 23-19s-19e, comp 35 bbls per hour 11,610 to 11,615 ft.

NORTH LOUISIANA

BIENVILLE PARISH—Hunt Oil Co. & Seaboard's Good Pine Oil Co. 1, c se se 30-14n-5w, rur. DeSoto O&G Co.'s Wm. Ashley 1, sw se 15-16n-10w, dr 2780 ft. Wm. Ashley 2, 15-16n-10w, lcn. Lide & Greer's W. J. Smelley 1, se nw sw 18-16n-5w, elev 231 ft, dry in drill stem test 6658-78 ft, top Travis Peak 6976 ft, dr 6958 ft.

BOSSIER PARISH—Ray Overlees et al's Biedenharn 1, 23-21n-14w, sd 300 ft.

CADDO PARISH—R. W. Norton's Payne 1, se se 27-23n-16w, coring 9835 ft. W. J. Hunter's Stoer 1, 10-15n-15w, arr test, sg, td 5500 ft.

CLAIBORNE PARISH—Bevill et al's Alex Edmonds 1, ne ne 16-20n-5w, dr 2845 ft. United Gas P. S. Co. et al's Carter Unit 1, 32-20n-5w, tested est 12 mil ft gas at 5601-45 ft, dr 5696 ft.

DE SOTO PARISH—Grogan Oil Co. et al's Ramsey A-1, 36-11n-11w, rur. Chamberlin et al's Lanier 1, 29-11n-11w, dr 2436 ft. Pearl Oil Corp. et al's Joyner 1, 28-11n-12w, installing heavier rig, 3030 ft.

GRANT PARISH—R. W. Fair et al's R. L. Gay 1, 46-6n-3w, dr 1825 ft. H. M. Smith & J. V. McConnell's Ivy McNeely 1, 16-6n-3w, sd 30 ft, curing titles.

FRANKLIN PARISH—Jensen et al's Grayson 1, c ne 36-12n-6e, top Cockfield 575 ft, coring 583 ft.

LINCOLN PARISH—Glassell & Glassell's A. P. Gray 1, 16-20n-3w, elev 196 ft, massive anhydrite 3880-4101 ft, dr 4450 ft. H. D. Easton & Belmont Quadrangle Drlg. Co.'s G. W. Dye 1, ne ne 21-19n-4w, spd. E. T. Oakes, Easton & Evans, R. L. Sanderson 1, 30-18n-1w, dk.

NATCHITOCHES PARISH—Jack Lent et al's Locke 1, 26-9n-9w, dr 1990 ft. Roy Raines et al's Allen Plantation 1, nw ne sw 22-9n-10w, woc surf csg, td 220 ft.

RAPIDES PARISH—C. L. Decker's Lee Lbr. Co. 1, se ne 21-5n-3e, dr 800 ft. F. W. Martin & Co.'s Hill 1, 24-5n-4w, spd. R. D. Webb's Brasher 1, 22-4n-2w, fsg 5255 ft.

SABINE PARISH—Deep Rock Oil Co. & Kirk-Greenway's Whitney Corp. 1, nw nw 8-9n-13w, elev 290 ft, 9⅝ in csg 5251 ft, testing, td 5709 ft. A. C. Scott's Bowman-Hicks 1, 23-9n-13w, claim 4 ft so 3085-88 ft, set csg, testing with so, td 3088 ft.

WEBSTER PARISH—Bass Drlg. Co.'s Tom Crichton 1, nw nw 21-20n-9w, dry abn, td 6420 ft. Magnolia's D. G. Cox 2, 22-21n-10w, dr 6571 ft; Ira Cox 6, 23-21n-10w, dr 3977 ft; G. W. Cole 2, 27-21n-10w, dr 8125 ft. Ohio Oil Co.'s A. J. Hodges 2, 23-21n-10w, dr 8418 ft; A. H. Gray 1, Acct. 2, 26-21n-10w, dr 8322 ft; S. P. D. Coyle 1, 23-21n-10w, dr 7940 ft; R. M. Coyle 2, 22-21n-10w, dr 7610 ft; L. M. Gardner 1, 22-21n-10w, dr 6450 ft. Woodley Pet. Co.'s Gray B-4, 27-21n-10w, arr run 7-in csg to bottom and perf at Bodcaw sand, td 8444 ft. Standard Oil Co. of La.'s E. L. Stewart 1, 32-21n-10w, elev 240 ft, base massive anhydrite 4761 ft, dr 5076 ft. N. V. Duncan et al's Mayfield 1, 9-20n-9w, tested 200 ft sw in 15 minutes 2783-97 ft, arr plug back and re-test, td 2797 ft.

MICHIGAN

GRATIOT COUNTY — Chas. Anderson's Askergrad 1, sec 9-9n-1w, sd 521 ft. Sam Siegel's Kerr 1, sec 36-10n-1w, sd 2250 ft. H. B. Cowdery's DeVuyst 1, sec 11-10n-2w, rig. Gulf Refining Co.'s Lyon 1, sec 26-9n-2w, dr 1935 ft.

HILLSDALE COUNTY — Jacob Beck's Fee 2, sec 15-6s-3w, dr 2540 ft. Hughes Heinig's Daley 1, sec 10-7s-4w, fsg 1500 ft.

NEWAYGO COUNTY — M. R. Schemahorn's Cain 1, se nw sw 24-12n-11w, lcn. Muskegon Development Co.'s Carlson 1, sec 9-16n-12w, lcn.

OTSEGO COUNTY—Dion Geraldine's Fee 1, sec 34-30n-3w, lcn. Harley William's Raae 1, sec 15-30n-1w, sd 2250 ft. Barton & William's Yuill 1, sec 9-32n-3w, lcn.

SAGINAW COUNTY—Mid West Petroleum Co.'s Shields 1, ne nw sw 5-11n-2e, dr 670 ft. Doran & Hilliard's Dobs 1, sec 33-11n-1e, rig. Darke Brothers' Hart 1, sec 11-11n-3e, dr 190 ft.

MISCELLANEOUS COUNTIES—Cass: L. T. Barber's Beebe 1, sec 3-5s-15w, sd 1140 ft. Emmet & Cheboygan's Barney 1, sec 12-35n-4w, rig. Gladwin: Dibble Brothers' Kimble 1, sec 16-18n-1e, rig. Iosco: Pabst Pet.'s Monfort 1, sec 8-4n-1w, dr 300 ft. Missaukee; Rex Oil Co.'s Meekoff 1, sec 30-21n-6w, fsg 3100 ft. Tuscola: C. W. Spaulding's Darymple 1, sec 35-10n-7e, lcn.

MONTANA

FERGUS COUNTY—White Top Oil & Gas Co.'s 1, 35-14n-19e, spd.

PONDERA COUNTY—Kirk Oil Co.'s Kellogg 1, se nw ne 21-28n-4w, fsg 2300 ft.

YELLOWSTONE COUNTY — Broadview Dome Oil Co.'s Halbritter-Stoltenberg 1, se ne 18-3n-22e, dr 187 ft.

NEBRASKA

DAWES COUNTY — Stephens Petroleum Corporation's S. J. Palmer 1, nw sw 10-35n-50w, dr 2418 ft.

LINCOLN COUNTY — Smith & Wright's Hansen 1, csw nw 24-15n-31w, dr 1967 ft.

SIOUX COUNTY—J. M. Huber Corporation's Morgan 1, csw sw 32-35n-56w, sd 2900 ft.

OKLAHOMA

ALFALFA COUNTY—Olson Drlg. Co. et al's Acre 1, csw ne 14-24n-11w, do 5930 ft.

BECKHAM COUNTY — Mid-American Oil Co.'s Biscoe 1-A, sw sw sw 28-8n-22w, dr 1945 ft. Carter Oil Co.'s Porter 1, csw sw 36-10n-25w, dr 3350 ft. Carter's Bingham 1, ne ne ne 31-8n-26w, dr 1469 ft.

CADDO COUNTY—Clyde Becker et al's Pharris 1, cse se nw 24-6n-12w, woc 298 ft.

CARTER COUNTY — Shell Pet. Corp.'s Smith 1, cnw se ne 30-5s-1e, c & p.

CLEVELAND COUNTY—Hollenback's Stinson 1, nw nw ne 17-9n-2w, sd 6195 ft.

COMANCHE COUNTY — C. V. Morris' Young 1, se ne se 24-3n-10w, dr 1000 ft. C. Holliday's Kuntz 1-A, cse ne se 21-4n-11w, sd.

GARFIELD COUNTY—Ohio Oil Co.'s State 1, sw sw sw 13-23n-2w, dr 4746 ft.

GARVIN COUNTY—Carter Oil Co.'s Potts 1, ce½ se nw 36-1n-3w, lcn.

GRANT COUNTY—Carter Oil Co. et al's Crisman 1, nw sw nw 16-25n-3w, dig cel. Carter et al's Kolarik 1, csl s½ sw 4-26n-5w, bldg rig.

GREER COUNTY — Nelf-Godfrey-Andrea's Melton 1, cse nw se 16-3n-22w, dr 3758 ft.

HASKELL COUNTY—Continental Oil Co.'s Anderson 1, sw se ne 33-8n-20e, dr 3478 ft.

HUGHES COUNTY—Cap Rock Oil Co.'s Parks 1, csw se 34-7n-8e, dr 3510 ft. Chas. Thornton's Eason 1, ne ne nw 7-9n-11e, woc. E. H. Moore's Buck 1, nw sw sw 21-8n-10e, dr 1700 ft.

JEFFERSON COUNTY—Olson, Heenan & Co.'s Rose 1, csw sw 1-5s-5w, dr 4895 ft. A. T. Campbell et al's Trout 2, cw½ w½ ne 6-8s-7w, td 2206 ft, D & A.

JOHNSTON COUNTY — Neff-Godfrey's Chapman 1, csw se sw 36-4s-4e, lcn.

KAY COUNTY—Higdon et al's Nieman 1, ne nw ne 9-26n-3e, fsg 519 ft.

KIOWA COUNTY—Kiowa Oil Corp.'s Finder 1, csw ne 4-6n-20w, sd 130 ft. Argus Pet. Co.'s Osbourne 1, nw nw ne 9-7n-16w, run tbng 1275 ft.

LATIMER COUNTY—Clark Drlg. Co. et al's Wilson 1, cse se 15-5n-18e, dr 5112 ft.

LINCOLN COUNTY—Mid-Continent Pet. Corp.'s Logan 1-A, ne ne se 31-11n-5e, pop. Exchange Drlg. Co.'s Dowell 1, se se nw 10-14n-6e, td 3065 ft, to shoot.

LOGAN COUNTY—Helmerich & Payne et al's Randall 1, sw sw ne 24-16n-1w, dr 4297 ft. Eason Oil Co.'s Sisters 1, sw sw sw 24-17n-1w, dr 5423 ft.

LOVE COUNTY—Sinclair Prairie's Stockton 1, se se sw 26-6s-2w, co 6130 ft, to pb.

MARSHALL COUNTY—Stewart & Taylor's Chestnut 1, ne ne ne 23-8s-5e, tested 30 bbls oil & 6 bbls wtr 1st 24 hrs, sd.

McCURTAIN COUNTY—Wilcox O&G Co.'s No. 1, sw se sw 30-2s-27e, matr on ground.

MURRAY COUNTY—Russell's Fee 1, se nw se 9-2s-3e, dr 2085 ft. O. O. Owens' Fryer 1, ne se ne 34-1s-3e, sd 1452 ft.

NOBLE COUNTY—Lincoln Oil Co. et al's Neil 1-A, ne ne ne 15-23n-2w, fsg 4826 ft. Summitt Drlg. Co. et al's Dolezal 1, se se sw 8-22n-1w, dr 4505 ft. Magnolia Pet. Co.'s Forsythe 1, se se sw 23-21n-2w, dr 4918 ft. Stanolind & Amerada et al's Johnson 1, nw nw se 4-20n-2w, rur.

OKLAHOMA COUNTY—Sunray Oil Co.'s Dickson 1, nw nw nw 17-11n-1e, mit.

OSAGE COUNTY—Helmerich & Payne's No. 1, ne ne se 13-23n-6e, dr 2045 ft. Mid-Co Oil Corp.'s No. 1, se se sw 22-23n-6e, dr 945 ft.

PAWNEE COUNTY—Carter Oil Co.'s Wells 1, ce½ se nw 30-23n-5e, rig & rust.

PAYNE COUNTY—H. F. Young's Jenkins 1, se ne se 4-17n-3e, dr 4595 ft. Riddle's Van Zandt 1, nw nw se 16-18n-3e, dr 2300 ft.

PONTOTOC COUNTY—Southern Oil Co.'s Young 1, ne ne se 17-3n-7e, mach & sd. Papoose Oil Co. et al's Jones 1, nw se nw 2-4n-5e, dr 2185 ft. Delaney et al's Norris 1, nw nw se 18-4n-8e, td 700 ft; made 1,000,000 cf gas, comp. Roodhouse et al's Booth 1, se nw se 20-2n-6e, woc 300 ft. Clark Drlg. Co. and Delaney's Richardson 1, se se sw 30-4n-8e, rur. Caloma Oil Corp.'s Brentz 1, se ne sw 4-1n-6e, td 1010 ft, sd. Sandbach et al's Whittaker 1, nw ne se 31-4n-6e, dr 1091 ft. Boettcher O&G Co.'s Cann 1, se nw ne 25-4n-7e, spd. Norbla Oil Co.'s Kennedy 1, se se ne 13-2n-5e, C & P.

POTTAWATOMIE COUNTY—Stanolind & Amerada's Billington 1-B, sw se sw 32-9n-3e, dr 1600 ft. Rich Oil Co.'s Fidler 1, ne ne nw 9-5n-5e, sd. Atlantic Ref. Co.'s Dooley 1, se se sw 9-11n-5e, rig.

PUSHMATAHA COUNTY—Erle Halliburton et al's Bogwell 1, sw ne ne 30-3s-15e, dr 1643 ft.

SEMINOLE COUNTY — Sinclair Prairie's Rossanna 1, nw nw sw 28-10n-8e, td 4189 ft, flo 1012 bbls oil, 2½ hrs, comp. Amerada & Stanolind's Reed 1, se sw se 19-10n-8e, sdo.

STEPHENS COUNTY—Edward's Frederick 1, ne se nw 31-2n-8w, td 2754 ft, sd. Carter Oil Co. et al's Harley 1, cne ne 24-2s-4w, dr 5280 ft. Penn State Oil Co.'s Cole 1, cw½ sw ne 21-2n-8w, sdo, 5575 ft. Wm. Angle et al's Sid Lang 1, sw sw ne 24-1n-7w, to dd. G. L. Pace et al's Tah-su-dah 1, se nw sw 27-1s-9w, sdo 2707 ft. Coline Oil Co.'s Johnson 1, csw se ne 1-2n-8w, to dd. Ed Parson et al's Olson Blake 1, csw nw 22-2n-8w, lcn.

TILLMAN COUNTY—I.T.I.O. Co. et al's Hatler 1, csw ne 32-2s-17w, 115 bbls oil and 94 bbls water, testing. Magnolia Pet. Co.'s Brown 1, csw se ne 21-3s-18w, dr 5339 ft. Cavens et al's Southerland 1, sw sw nw 35-4s-16w, rur.

SOUTH TEXAS

LAREDO DISTRICT

DUVAL COUNTY—A. J. Brinkoeter's P. Garza de Rodriguez 2, sur 212, pumped 75 bbls per day, td 2665 ft. Humble Oil & Ref. Co.'s Roos Brothers 1, sur 119 comp pumped 10.4 bbls per hour on potential test, td 2871 ft. Kepley Prod. Co.'s Clara Driscoll Sevier 2, Rafeal Rosalia Gr, sp. King Dr. Co.'s Atlee Parr 1, San Andres Gr, move in part of drk. George Parr Oil Co.'s F. Vaellox Puig 1, San Andres Gr, set csg at 4800 ft. Penn-Palangana Oil Co. et al's C. K. Gravis 1, sec 254, dr 3300 ft. Reynolds' & Richardson's D. Ruiz Est. 2, C. & M. Ry. drlg 1725 ft. Reynosa Oil Co. et al's F. G. Wilson 1, Santos Flores Gr, drlg 4580 ft. Russ Pet. Corp. et al's (Highland Oil Co.) A. Faris 1, sec 9, sweden subd, flowed 8½ bbls per hour 5/32 in ch. TP 700 lbs CP 750 lbs, td 4804 ft. Trahan & Tuttle's J. C. Megerle 1, sur 245 sd 900 ft. Geo. V. Viteri et al's Emilio E. Cadena 1, J. M. Hinojosa Gr, coring oil show 4249-53 ft, td 4625 ft.

JIM HOGG COUNTY—Nordan's & Morris' W. H. & R. T. Badger 1, sur 640, d & a td 2610 ft. T. O. Shappell Oil Co.'s Thompson 1, blk 2 sh 2 Las Animas Gr, ru.

McMULLEN COUNTY—H. K. Boysen's J. E. Murphy 1, J. E. Murphy sur, D & A 2354 ft. De-Sel Oil Co.'s Lucy M. Clunch 1, M. Hely sur, abnd 1292 ft. Harrison & Danvers' J. A. Jungman 1, M. Hely sur, dr below missed snd, td 1100 ft. W. L. Hinds' Douglas W. Rhodes 1, H. Nadler sur, ru. W. P. Howard's B. C. Claunch 8, M. Hely sur, dr plugs & testing 1110 ft. Howell Oil Co.'s J. H. Martin Hrs. 1, sur 213 resumed dr installed new boiler, td 2200 ft. Edwin M. Jones' Harry Ezzell 3, Thos. Adams sur, comp gas well, pb td 1260 ft, 10 mil cu ft, td 5301 ft; Harry Ezzell 4, H. Russell sur, sp; Harry Ezzell 6, C. Q. Ragland sur, wor wtr well comp. J. T. Lanier's E. R. Hagist 1, sur 481, dr 900 ft.

STARR COUNTY — Calderoni's-James'-Follette's Francisce Rodriguez 1, blk 3, sh 56 por 80 J of Camargo, dr 150 ft. W. F. Dolgener et al's Y. Garcia de Garcia 1, J of Mier no report, td 402 ft. K. E. Merren's Starr County Cattle Co. 1-A, blk 34 of Jefferies & Lambeth subd, logged Cockfield 5376 ft-5379 ft, stuck pipe while coring out w/core bbl hole cleared prep to core ahead, td 5379 ft. Henry Mode et al's Kelsey Bass 1, por 86 & 87, dr 850 ft. Moss & Heard's S. B. Ricaby 2, por 83 D&A at 2011 ft. F. P. Schwab's & Fred Foster's Antioco Munoz et al 1, Javali Grant ran electric formation tester D&A, td 2309 ft. Transwestern Oil Co. et al's T. B. Slick Est. 2, sec 527, dr ahead at 5200 ft in pb hole, td 5659 ft, old hole.

WEBB COUNTY — Bolling & Coffey's A. Villareal 1, sur 768, dr will go to Bruni snd—ran electric formation tester, set csg on Mirando snd showed about a 10 bbl well, td 2000 ft. Dolores Oil Co.'s Emma Adami 1, sur 15, lcn. Eugene Garner, Jr.'s R. Saldivar 2, drilled plugs testing oil snd, td 1000 ft. Ina Oil & Ref. Co.'s F. M. Shaver's W. E. Trafton 1, sur 281, part of tools on lse stdg. (?) Kepley Prod. Co.'s W. C. Billings 1, sur 6, abnd 2303 ft. J. W. Magee's E. Garcia 1, Henry James subd, stdg 40 ft. Locke Purnell & Cole Pet. Co.'s Rosa Benavides 1, sur 677, abnd 3508 ft.

ZAPATA COUNTY—Lewis Prod. Co.'s Martinez 1, El Grullo Gr, blk 123 snd 2240-2250 ft, sw abnd td 2259 ft. H. G. Lewis' S. Benavides 1, Villa Grant coring shells & lignite, td 2056 ft. Lundell Prod. Corp.'s I. Ramirez 1, blk 25 D&A 2508 ft. J. O. Sheffield's C. H. Buck 1, blk 15, ru. Westheimer's & Daube's E. Lopez 1, sur 288, dr 1212 ft.

SAN ANTONIO DISTRICT

BASTROP COUNTY—Marts & Beavans' R. A. Harris 1, Timothy McKean sur, dr 2141 ft.

BEXAR COUNTY—Algra Oil Co.'s Edward G. Peters 1, Miguel Gotari sur, td 815 ft, sd. American Gas Co.'s Oliver 5, M. F. Rodriguez sur, prep to resume dr td 3425 ft. Carle Chemical Co.'s Frank P. Carle 1, 343-ac tr, dr Del Rio Play 242 ft. Woodward & Hardie's R. W. Devilbiss sur, temp abnd at 2284 ft. Woodward, Hardie's & Herrald's Hermann Sons 1, sur 37 temp abnd 1720 ft.

BLANCO COUNTY — E. L. Nizon's H. Hohenberger 2, Adolph Jones sur, dr 1200 ft.

CALDWELL COUNTY—B. C. Armstrong et al's Wilson Bell 1, n por Luling townsite drk. R. T. Belcher's Mrs. G. Moody 1, Solomon Seal sur, lcn cleared. E. R. Cosby's W. H. Cosby 1, Maxwell sur, testing 1847 ft. Adolph Dovre's M. W. Calliham 1-A, Dillard Cooper sur, will acidize later, td 2235 ft. Fain Gillock's Mrs. J. P. Walker 1, A. Floyd sur, lcn. W. E. Housel et al's M. C. Driscoll 1, James Berry sur, sd 1544 ft. J. O. Mack's B. Withers 1, W. House sur, dr 1112 ft. McNeil Pet. Corp.'s Will Clark 1, J. R. Miller sur, sp. Sherman Nelson's A. B. Etheridge 1, Thad Hunter sur, acidized pumping 15 bbls of oil 110 bbls sw per day, td about 2180 ft. Rosita Oil Co.'s Lockhart State Bank 1, John Roe sur, lcn. Stapper Pet. Co.'s E. Martin 1, A. Floyd sur, dr 975 ft. F. R. Williams' H. L. Rodenberg 1, James Berry sur, dr 1200 ft.

DIMMITT COUNTY — Paul C. Teas' & Maryland Oil Corp.'s S. E. McKnight 1, sec 23, lcn. Wilcox Oil & Gas Co.'s Light Ranch 1, I & G N sur, dr ahead 5986 ft.

EDWARDS COUNTY — Dan Auld's Mrs. Mamie Rigsby 1, G. C. & S. F. sur, dr out cement after cementing off lost bailer btm, td 3085 ft.

FRIO COUNTY—Amerada Pet. Co.'s Mrs. D. D. Harrigan 1, Salvador Flores sur, dr new hole 2635 ft, td old hole 6290 ft. H. A. Pagenkopf's & L. C. Jameson's Blackaller Est. 1, James Gourley sur, lcn for 3250 ft, Edwards test, prep to sp about 6-1-37.

GONZALES COUNTY — Canoe Creek Oil Co.'s W. L. Bolts 1, W. A. Matthews sur, sd.

GUADALUPE COUNTY—R. T. Belcher's J. T. Fulcher 1, Robt. Smith sur, set sur csg woc. J. Kenneth Blackmar et al's Cora & J. E. Mackey 1, James Hodges sur. Eagle Ford sh showed some oil acidizing, td 2740 ft. J. E. Clark's Paul Knodel 1, Green DeWitt sur, td about 2460 ft, acidizing only slight oil show. Louis Crouch et al's Mary E. King 1, J. D. Clements sur, testing on pump, td 2230 ft. Ralph E. Fair, Inc.'s Fritz E. Hemple 1, G. W. Williams sur, coring ch showing oil, td 2025 ft, Felmont Oil Corp.'s Lizzie Schueneman 1, Green DeWitt sur No. 11, td in ch 2433 ft, acidized w 4000 gals, bailing some oil. Kennedy & Crowley's Gus Jahns 1, Jose K. Davis sur, running tbg 2507 ft. Riddle Oil Co.'s Ned Herff 1, Eligio Gortari sur, cement back & prep to gun perf in ch, td 2209 ft. V. G. Schimmell et al's Mrs. Wilhelmina Schneider 1, Jesus Cantu sur, abnd showed for very small well, td 2132 ft.

HAYS COUNTY—N. G. Williams' Frances Jennings 1, Venmonds sur, lcn.

LEE COUNTY—James E. Pederson's C. A. Turner 1, David Hudson sur, D&A, td 6560 ft.

MILAM COUNTY — Kingdorr Exploration Co.'s J. C. White et al 1, Bynum Wickson sur, lcn. Minerva Refining Co.'s Shelton Estate 3, Wm. Allen sur, ru & sd.

TRAVIS COUNTY—R. M. Kyle's W. D. Hunter 1, J. Burleson sur, dr 165 ft.

WILSON COUNTY—Maryland Oil Corp. et al's Cynthia N. Tremmell 1, M. May sur, dr 1750 ft. R. C. Stanley's E. M. Heirholzer 2, Salina sur, lcn.

ZAVALLA COUNTY—H. F. Wilcox's T. J. Gillam 1, G. W. T. & T. Ry. sur, shut in bldg storage flowed 52 bbls 1st 30 min, 85 bbls 2nd 30 min, 9 bbls 3rd 30 min of 1½ hr test, td 3947 ft.

CORPUS CHRISTI DISTRICT

ARANSAS COUNTY—Barnsdall Oil Co.'s Kate Edwards 1-A, Wm. Lewis sur, dst 7545-8029 ft, showed gas 3000 ft, water cushion prevented it from showing any pres, tool open 20 min, now reaming.

BEE COUNTY—Butler & Turner's J. R. Scott 1, sec 7 dr 4065 ft. Illinois Pet. Corp.'s Mrs. M. M. McKinney 2, L. C. Randolph sur, dr 1150 ft. Fred Shields et al's Homer Harris 1, P. Wilcox sur, dr 3245 ft.

BROOKS COUNTY—Gillord Oil Co.'s Wm. Singer 1, sur 630 coring 1314 ft. Standard Oil Co. of Texas' Mestina Oil & Gas Co. 1, Salinas sur, coring sh 4227 ft; Mestina O&G Co. 6, R. G. Salinas sur, flow clean oil, good well, no gauge shut in, td 3002 ft.

CAMERON COUNTY—Ruez-Morton, Inc.'s United Land Ir. Co. 1, lot 7, blk 402, El Jardin sub, prep to move in for 7500 ft test. Stapper Pet. Corp.'s Port Isabell Irr. Co. 1, Port Isabell Irr. Co. subd, resuming operations 7820 ft, td.

GOLIAD COUNTY—Goliad Oil Co.'s S. E. Cole 1, lot 33, range 4, Goliad Town Grant, cored 18 in snd to 5544 ft, dr mud blown out of hole, heavy gas press, shut in with blow out preventor, td 5544 ft.

JIM WELLS COUNTY—John Camp Prod. Co.'s J. W. Bird 1, 425 ac tr, dr below 5100 ft. John F. Camp Dr. Co.'s W. E. Pipe 2-B, sec 13, Richard King farm lots, sp. Magnolia Pet. Co. et al's A. A. Seeligson 7, Los Jabonicillos sur, dr 1276 ft. Premont Royalty Co.'s H. Fealey 1, sec 72, set sur csg woc. Smith Drlg. Co.'s W. D. Wade 1, 1 mi e of Sandia produc-

tion, dst at around 5100 ft, rec 273 ft mud, oil & gasoline, 300 lbs press, 10 min coring ahead, td about 5100 ft.

LIVE OAK COUNTY—R. A. David's John & J. P. Marbach 1, Stephen Hays sur, dr 600 ft. R. H. Feltner's Sanger Ranch 2, G. C. & S. F. sur, dr 600 ft. Loma Oil Co.'s C. L. Terrell 1, J. Houghihan sur, drk up. F. D. Salter et al's I. W. Griffith 2, sec 20, McCown Ranch set csg woc, td 924 ft. Sam Wilson, Jr.'s Southwestern 1, sec 57, abd 4605 ft.

NUECES COUNTY—Clarkwood Oil Co.'s H. B. Baldwin 1, blk 11, Russell Farm Lots, dr below 6650 ft. Fain Gillock et al's Robt. Poenisch 1, lot 11, blk 32, ru. W. L. Hinds' Luch J. Rivers 1, sec 301, sp and sd. Navarro Oil Co.'s E. M. Poenisch 1, lot 21, blk 41, mim. Phillips Pet. Co.'s John Harney 1, sh 11, Harney Lands, coring 5000 ft. Seaboard Oil Corp.'s James Luby 1, blk 4 Luby subd, apparently no water, likely will dr to 7000 ft and test any shows, td 4339 ft. Shell Pet. Co.'s State of Texas 1, Laguna Madre Bay, piling driven and sd. Southern Minerals Corp.'s W. H. Harvey 1, Garcia sur, move in drk to ru and recement well to shut off wtr, 65 percent salt water, td 9002 ft.

REFUGIO COUNTY—Carter & Steiernberg's Quirino Vela 1, por 85, mim. Chew & McIntyre's Willie Daaman 1, sec 15, lcn for 6500 ft test.

SAN PATRICIO COUNTY—Conroe Drilling Co.'s F. L. Foley 1, C. F. Delman sur, sp. Danrey Oil Co.'s Jean Davis 1, Wm. Boyd sur, drk. Phillips Pet. Co.'s B. E. Ivey 1, sec K, Pauls subd, dr 4005 ft.

VICTORIA COUNTY—Magnolia Pet. Co.'s Willie Beck 1, TNO RR sur, perf 3574½ ft to 3578 ft, shut in 5 hrs, opened 4 hrs, flowed wsh wtr 3 min then flowed dry gas through ⅛ in ch, tp 900 lbs, cp 1500 lbs. Transwestern Oil Co.'s A. M. McFadin 3, J. Viarin sur, coring 4890 ft.

WILLACY COUNTY—Ruez-Morton, Inc.'s Johnson-Stillman 1, lot 14, blk 25, sh 44, completed 4 mile wtr line, prep to dr out plugs to resume work. Shell Pet. Co.'s Yturria Land & C. Co. 1, sh 64, Juan de Carritos gr, coring hard standstone, td 9815 ft.

EAST TEXAS BORDER COUNTIES

CASS COUNTY—McAlester Fuel Oil Co.'s J. J. Dooley 1, Calloway Davis sur, elev 246 ft, Georgetown lime 3690-4401 ft, top Paluxy 4530 ft, massive anhydrite 6149-6214 ft, sd 6503 ft. Magnolia's Harper & Thatcher 1, Jacob Carsner sur, pb to 5965 ft, swabbing, old td 6675 ft. United's J. W. Land 1, Robt. Potter sur, perf csg at 6520-25 ft with 31 shots, testing at 6533 ft with good show gas and distillate in lower Glen Rose lime, old td 7255 ft.

HARRISON COUNTY — H. H. Alvord's Flannagan 2, L. Womack sur, dr 2000 ft. Fields & Rector's Anderson Williams 1, G. P. Harrison sur, sr 2395 ft. Geyer Oil Co.'s Vincent B-2, C. Davenport sur, 5-in csg 2362 ft, woc, td 2392 ft. Highway 80 Oil Co. of Texas' Mabel George 1, J. S. Powell sur, dr 925 ft. Patsam Pet. Corp.'s A. G. Vincent 1, G. P. Harrison sur, 7-in csg 2376 ft, treated with acid, flowing wo gauge, td 2396 ft.

MARION COUNTY—Ark. La. Gas Co.'s C. C. Braden 1, Thos. Hanson sur, top anhydrite stringer 5181 feet, base of massive anhydrite 5687 ft, coring 5800 ft; Laura McIntosh 1, Wm. Edmonson sur, claim so&sg 6654-65 ft, pb to 5980 ft, perf csg 5918-45 ft, tested est 925,000 ft gas and half bbl oil per hour after acid treatment, still testing, old td 6925 ft. The Hunter Co.'s E. W. Fonda 1, A. de los Santos Coy sur, 7-in csg 6082 ft, gauged 230 bbls oil in 24 hours thru 7/16-in tubing choke, gas-oil ration 635-1, td 6096 ft (Gloyd); E. W. Fonda 2, A. de los Santos Coy sur (632 ft nw of No. 1), rur. Ark-La. Gas Co.'s Allen Houston 1, 427 ft n of sl and 782 ft e of wl 30-ac tract, A. de los Santos Coy sur, mim. Fohs Oil Co.'s Mary McReynolds 1, 466 ft s and w nec 40-ac tract, A. de los Santos Coy sur, mim.

PANOLA COUNTY—Danciger O&R Co.'s J. W. Tatum 1, Alfred Bissell sur, spd. R. B. Dearing et al's Wooten Est. 1, Winny Mann sur, sd 2350 ft. Glassell & Glassell's Pierce & Chesbro 1, Julia Soape sur, 16-in csg 922 ft, dr 3165 ft. Magnolia Pet. Co.'s E. A. Hull 2, Thos. Applewhite sur, elev 222 ft, sg and show distillate 5885-5900 ft, setting 9⅝ in csg 5948 ft, to drill to lower Marine. Socogee Oil Co.'s Trosper 1, Larkin Smith sur, 7-in csg 2400 ft, woc, td 2445 ft.

SHELBY COUNTY—Wm. Redditt et al's Pickering Lbr. Co. 1, Stephen English sur, elev 303 ft, top Blossom 2310 ft, dr 3320 ft. H. A. Stebbinger et al's Pickering Lbr. Co. 2, A. Hanson sur, pb and perf csg 5033-37 ft, showing est 10 mil ft gas per day and 6 bbls dist. per hour, old td 5126 ft.

TEXAS GULF COAST

AUSTIN COUNTY—Temple Hargrove & Cockburn's Forester 1, New Ulm area, A. J. Bell sur, fsh 3944 ft.

BRAZORIA COUNTY — Pure's Slade 1, Peach Point prospect, S. F. Austin sur, abst. 20, fsh 7842 ft. John Byer's Lockwood & Sharp 1, Smithers Lake area, Wm. Mahon sur, dr below surface csg.

COLORADO COUNTY—Humble's Relaw 1, Eagle Lake area, L. Duggat sur, dr shale 3788 ft.

HARRIS COUNTY—H. J. De Arman et al's Tyrell & Garth 1, Cedar Bayou prospect, L. Heminway sur, abn 7029 ft. Stanolind's Oates 1, Clinton area, C. Martinez sur, pulling tubing at 8088 ft. Superior's Butler 1, Bammel area, J. Ehrhardt sur, dr shale 6545 ft. Texas Gulf's Gillespie 1, Aldine area, S. Contreras sur, shut down 7100 ft.

JEFFERSON COUNTY—Magnolia's Phelan 1, sw of Amelia, Cheek area, S. Stivers sur, sd at 8602 ft.

MATAGORDA COUNTY — Continental's Hawkins 2, Sheppards Mott area, D. McCarthy sur, dr shale 4329 ft. Sun's Craig 2, Hawkinsville area, J. Williams sur, dr shale 5769 ft. United North & South Dev. Co.'s C. O. Stoddard 1, sw of Buckeye, M. Cotton sur, sd 9895 ft. Royal Oil Co.'s Ewing 1, Sugar Valley area, Burnett and SoJourner sur, dr shale 3208 ft.

POLK COUNTY—C. E. Gates' Texas Long Leaf Lumber Company 1, Splendora field, Walker County School Land sur, dr shale 1186 ft.

WALLER COUNTY—Stanolind's Hargrove 1, Katy area, T. S. Reese sur, testing 7500 ft.

WYOMING

ALBANY COUNTY—Hal Blakeman's Chappell 1, cne nw 33-21n-76w, moving in rotary equipment after co to bottom at 1681 ft.

CONVERSE COUNTY—Chadron-Osage Oil Co.'s State 1, sw sw 16-32n-69w, preparing to underream 8 in csg to top of sand at 3200 ft to shut off 2700 ft of water in hole from upper sand. Well has so below 3200 ft and will test. Elbe Oil Land Development Co.'s Benham 1, nw ne 5-31n-70w, moving in rotary. Wyoming Southern Oil Co.'s Jennie Everett 1, nwc sw¼ 26-32n-69w, dr 495 ft and preparing to run casing to gas sand.

PARK COUNTY—General Petroleum Corporation's Government 1, sw nw nw 33-47n-100w, delayed by premature explosion of shot in 9⅝ in casing at 5350 ft, milling on junk and will clean out to test Tensleep at 5903-5996 ft. Well was bailing 125 bbls black oil daily without lowering oil standing 600 ft in hole from Tensleep formation.

UTAH

GRAND COUNTY — Columbia Crude Oil Corporation's Rath-Government 1, ne sw 12-25s-20e, resuming drilling at 2265 ft after moving in new tools. Cane Creek Oil Co.'s Government 1, nw sw 31-26s-21e, rur. Utah Southern Oil Co.'s Hyde-Government 1, s nw nw 32-22s-20e, sd 6715 ft.

EMERY COUNTY — Continental & California's Unit 1-A, nw nw 27-33s-11e, dr 4361 ft.

For Sale or Rent

QUARTERBOAT

Size 24′x78′x5′; draws 24″; steel hull with steel deck; 2-story house 20′x70′.
Lower floor includes large mess hall, with cook's quarters in connection; bath and toilet and 2 separate cabins.
Upper floor has large dormitory accommodating 30 men, and 4 separate cabins.
House in good condition and will accommodate 50 to 60 men.

McWILLIAMS DREDGING COMPANY
1021 Hibernia Bank Building
New Orleans, La.

LEGAL NOTICE—The Board for Lease of Eleemosynary and State Memorial Park Lands of the State of Texas will receive sealed bids until 10 o'clock A. M. June 24, 1937, in the General Land Office at Austin, Texas, for oil and/or gas lease on approximately 956 acres in William Partee survey, Cherokee County, Texas. For further information address Wm. H. McDonald, Commissioner, General Land Office, Austin, Texas.

POSITION WANTED
LABORATORY TECHNICIAN, GEOLOGIST

B.S., Univ. Ill., '34; M.A., Smith, '36 in geology. B.S. thesis in micro-paleontology. Training in chemistry and photography. 3 years as technical assistant in geology dept. at Smith. Available immediately for work anywhere.

MARGARET FRANCES HARPER
226 Penning Ave. Wood River, Ill.

GEOPHYSICAL SOIL SURVEYS FOR OIL
10 Sample Survey $50. Total Cost: Mid-West

GEOLOGICAL SCIENTIFIC SERVICE CO.
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William M. Barret, Inc.
Consulting Geophysicists
Specializing in Magnetic Surveys
Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique.
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Fifteen Years Practical Experience
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428-29-30 Bankers Mortgage Bldg.
Phone Fairfax 8232 Houston, Texas

JACK A. SCHLEY
Patent Attorney
(Established 1902)
PATENTS—INFRINGEMENTS—OPINIONS
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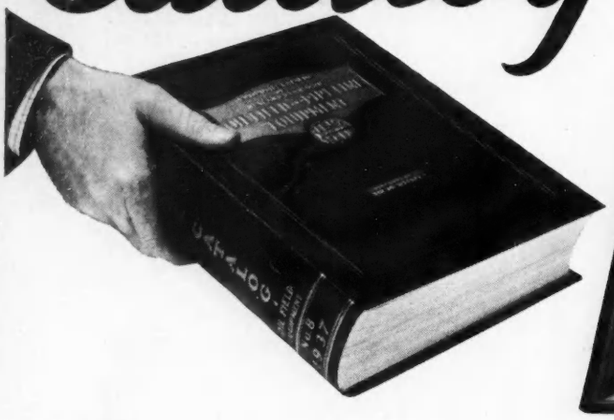
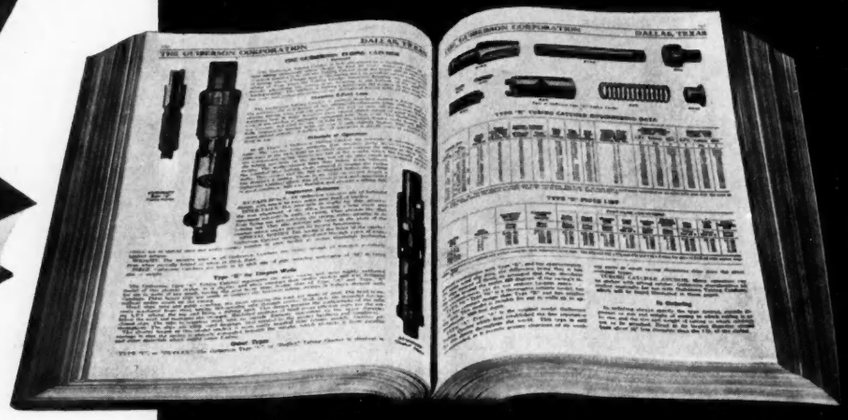
THE FORT WORTH LABORATORIES
Field Gas Testing. Analysis of oil field brines, gas, minerals and oil. Sell Thermometers, Hydrometers and Laboratory Glassware.
F. B. Porter, B.S., Ch. E., Pres.
R. H. Fash, B.S., Vice-President
828½ Monroe St., Ft. Worth, Tex.

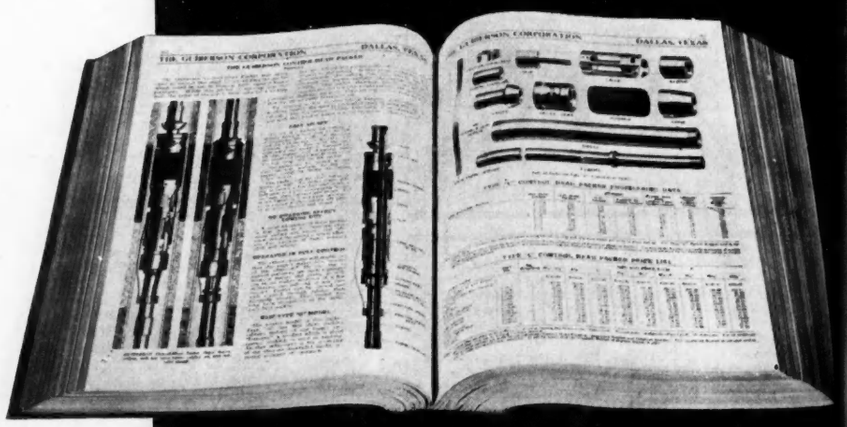
FOR RENT—A complete 1200-bbl. capacity gasoline refinery located in Shreveport. Formerly operated as the Griswold or Cedar Grove Refinery.

Apply J. E. Slattery,
1022 Slattery Bldg., Shreveport, La.
Phones: Res. 8-1476; Office, 7564

For Complete Guiberson Catalog







Just Refer to Your COMPOSITE CATALOG

GUIBERSON is pleased to announce that we have published the *complete* GUIBERSON Catalog in the 1937 Composite Catalog of Oil Field and Pipe Line Equipment. Our section in the "Composite Catalog" constitutes our *only* catalog for the year 1937.

For complete information and prices on any GUIBERSON specialty just reach for your Composite Catalog and refer to the GUIBERSON section, beginning page 711.

All GUIBERSON patented oil field specialties are fully covered, including GUIBERSON Swabs, Tubing Catchers, Tubing Spiders, Control-Head Packers, Tubing and Wire Line Oil Savers, Tubing and Sucker-Rod Strippers, Spiral Bottom Water Plugs and Packers, Friction Kelly Drives, Rotary Float Valves, Floor Blocks, Underreamers, Disc Bits, and Casing Tongs.

If you do not have the 1937 Composite Catalog, send for our reprint of the GUIBERSON Section, handsomely printed in color and ready for mailing.

THE GUIBERSON CORPORATION
Box 1106, Dallas, Texas

TULSA: 504 Wright Bldg.; HOUSTON: 2241 Herman Drive; WICHITA, KANSAS: 530 S. Fountain St.; NEWARK, OHIO: First & Locust Sts.; LOS ANGELES, CALIF.: W. R. Guiberson Co., 723 E. Gage Ave.; NEW YORK: 30 Rockefeller Plaza.

GUIBERSON

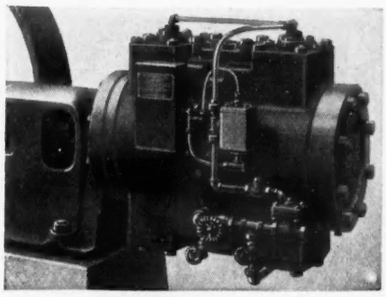
BETTER BE SAFE THAN SORRY

NEW PRODUCTS FOR THE FIELD
Machinery • Tools • Catalogs • Books

AUTOMATIC START-STOP CONTROL AND UNLOADER FOR COMPRESSORS

Worthington Pump and Machinery Corporation

Worthington Pump and Machinery Corporation, Harrison, New Jersey, announce an automatic start-and-stop control, combined with automatic equipment on motor-driven single-horizontal compressors, by using the magnetic unloader. No extra piping, valves or other devices are required.



Worthington Start-Stop Control and Unloader for Compressors.

This device operates on standard electric equipment and can be installed wherever a conventional automatic starter is used for controlling the compressor motor. The only other provision necessary is a pressure switch to operate a pilot circuit. The pressure switch control is transferred electrically from the motor starter to the magnetic unloader, and either position may be selected at will. If connected to the motor starter, the compressor starts and stops on the demand for air. When connected to the magnetic unloader, the compressor runs continuously and simply loads and unloads depending upon whether or not air is needed. If desired, the cooling-water supply can also be automatically controlled.

DRAW WORKS

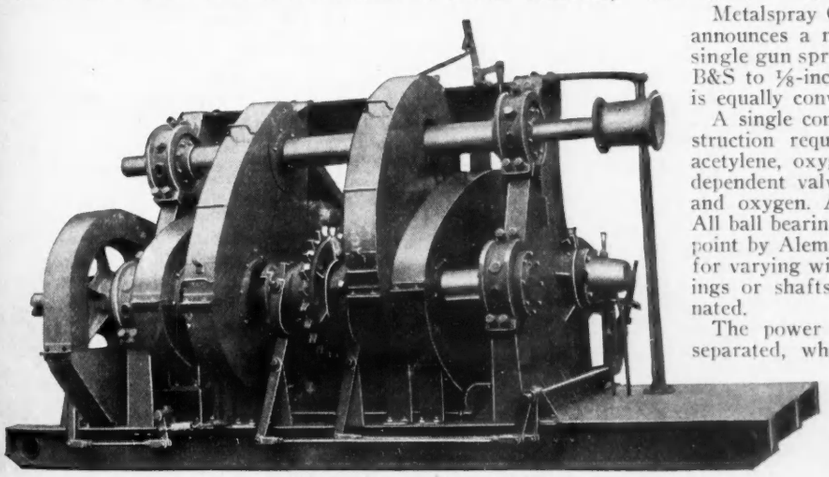
The Wheland Company

The Wheland Company, through its distributors, Lucey Products Corporation, Tulsa, offers a new Wheland-Lucey draw works featuring oil-tight chain housings which form oil reservoirs, and through which chains run constantly. Advantages of this feature are greatly increased life of chains and sprockets.

It has three shafts and sprockets and clutches are so arranged that four hoisting speeds and two rotary table speeds are available. The drum shaft is 8-inch diameter, lineshaft 7½-inch diameter, and jackshaft 7½-inch diameter. All shafts are mounted on heavy-duty roller bearings.

Completely unitized, side housings are solid cast steel with bearing boxes cast integral. This sturdy construction minimizes vibration and assures perfect alignment.

Brake flanges are water-cooled and brakes are standard Wheland-Lucey compounded type designed to hold the longest strings of pipe with minimum effort on the part of the operator.



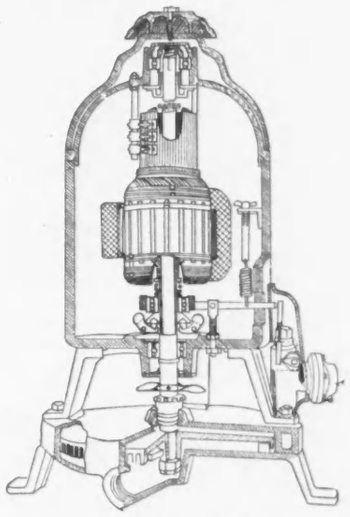
Wheland-Lucey Draw Works

VERTICAL OILLESS GENERATOR

R-F Electrical Manufacturing Company

R-F Electrical Manufacturing Company, of Shawnee, Oklahoma, is making the Frost Vertical Oilless Generator which is distributed through the supply companies by Bettis Sales Company, Houston, Texas.

Besides the obvious advantages of plenty of correct lubricant sealed in, to run from six months to a year, and with dirt and other injurious elements positively sealed out, the generator possesses other very advantageous improvements.



R-F Generator

Dynamic balance—that is a running balance, is obtained on all the rotating assembly, at the operating speed, before being incorporated in the construction of these machines. This tends to produce an almost vibrationless piece of mechanism, hence long bearing life.

An anti-runaway device is built into the valve in such a way as to prevent excessive speed or "runaway," with the resultant burning out of the derrick lights and sometimes the machine itself.

Ball swivel joints are used in the governor train to reduce friction or bind at any point, tending to highly increase the sensitiveness of the governor and governor valve, thereby giving much closer regulation under all conditions.

METAL SPRAY GUN

Metalspray Company

Metalspray Company, 113 Llewellyn Street, Los Angeles, announces a new metal spray gun, so constructed that a single gun sprays metals in any size of wire from 20 gauge B&S to ⅛-inch. As the gun weighs less than 4 pounds it is equally convenient for hand or lathe operation.

A single control valve of monel and special bronze construction requiring no lubricant, permits turning on of acetylene, oxygen and air simultaneously. In addition, independent valves permit separate adjustment of acetylene and oxygen. An air-ventilated nozzle eliminates backfire. All ball bearings, gears and worms are lubricated from one point by Alemite system. New type worm and gear change for varying wire speeds are made without removal of bearings or shafts. All bearing adjustments have been eliminated.

The power plant and combustion unit are completely separated, which, together with visible control of wire feeding wheels and external air turbine exhaust, gives the necessary power, varying wire speeds and flexibility to handle the wide range of wire sizes in all metals melting up to 4800° F.

Pounds of metal deposited per hour is in

direct ratio to wire size used. For instance, with ⅛-inch, 12-gauge B&S, and 15-gouge B&S, respectively, steel is sprayed at 8, 5 and 2½ pounds per hour; bronze at 15, 9 and 5½ pounds.

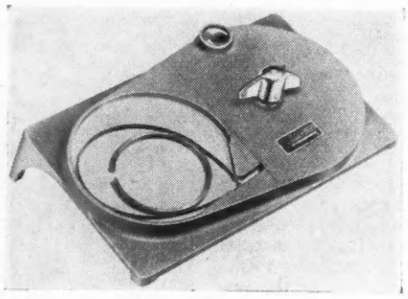
The process is used for the building up of machine elements such as shafts, sleeves, pistons, and reciprocating parts, using metals similar to the base, hard abrasive-resisting metals, or corrosive-resisting metals. Also for the lining of tanks, structural members, or any other surface, with corrosive-resisting metals. Deposits may be made ranging from 1/1000 inch to 1 inch in thickness. The deposits, with very few exceptions, resist corrosion and abrasion equal to similar metals in cast or drawn form. Any metal may be adequately bonded to any other type of metal, glass, wood, plaster, concrete, or any stable base.

PISTON RING GAUGE

Wilkening Manufacturing Company

Wilkening Manufacturing Company, Philadelphia, announces a measuring instrument for determining the true diameters of piston rings.

Neither moving parts nor the measuring tape are involved in adjusting the ring gauge. The scale is set at the factory to read correctly. The tape is made of Swedish



Wilco Piston Ring Gauge

steel and is fastened securely at each end to prevent stretching, so adjustment is seldom needed.

A master size ring is furnished with each instrument so the accuracy of the reading can be checked at any time. If necessary, adjustment of the dial reading is made simply by moving the scale to the right or to the left so it points exactly to the size on the dial corresponding to the size of the master ring.

The dial and all working parts are inclosed. The instrument is mounted on an inclined base so it is in the most natural position for easy use.

The gauge measures all rings from 2-inch to 6-3/16-inch diameter. This range covers the entire automotive field as well as most of the larger truck and tractor sizes.

PORTABLE ROTARY UNIT

Shaffer Specialty Company

Shaffer Specialty Company, Tulsa, has announced a new light portable rotary drilling unit. All power-transmission equipment in this unit is adequate to meet field conditions and load demands with a high factor of safety. The unit is designed for 3000 to 4000 feet using 3-inch drill pipe and 2500 to 3000 feet of 4-inch drill pipe.

The drawworks, table, one engine with transmission shaft including forward and reverse, are mounted permanently on one set of skids, moveable in one load. The slush pump and one engine are also mounted on a set of skids and are moveable in one load. The separation is made between the engines for distribution of the loads, although the drawworks and engines can be built as one unit with the table and pump separate if desired. Mounting the engines on top permits the shafting with chains and clutches to utilize the space beneath, thus maintaing the allowable road limit of 8 feet in width.

The unit is designed for multiple-cylinder engine drive. It is simple in design, employing assembled parts of standard make, minimum in number and free from excessive wear. Its construction assures long life and ready accessibility for adjustment and repair. Self-aligning roller bearings, alloy steel shafting, multiple roller chain, machined tooth steel sprockets and friction clutches are used throughout. V-belt is used to connect engine shafts to power shafts. The reverse is the idler sprocket and roller chain type. It is actuated through a friction clutch and is positive in action with immediate accessibility in either direction. The throttle, forward and reverse link are integral, especially designed for the convenience of the operator. The unit is arranged so both engines can be used on the pump and table for continuous operation by employing four speed changes for the rotary table drive.

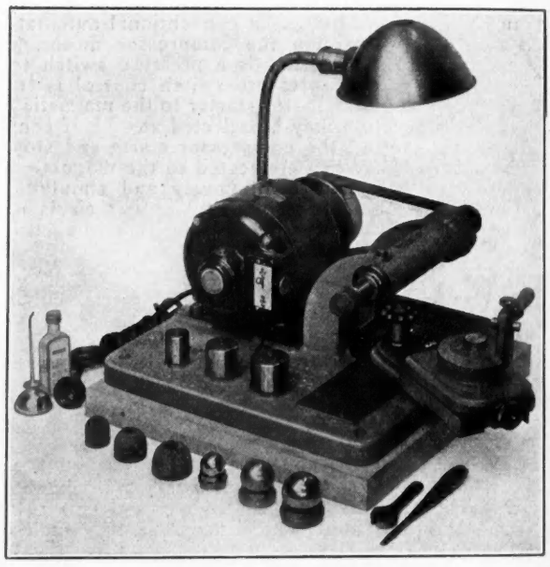
LOWER MISSISSIPPI DELTA

The Department of Conservation, Louisiana Geological Survey, New Orleans, has published a 454-page book on the "Lower Mississippi River Delta," embodying reports on the geology of Plaquemines and St. Bernard Parish. The book is No. 8 in a series of geological bulletins, and represents the work of R. J. Russell, H. V. Howe, J. H. McGuirt, C. F. Dohm, W. Hadley, Jr., F. B. Kniffen, and C. A. Brown.

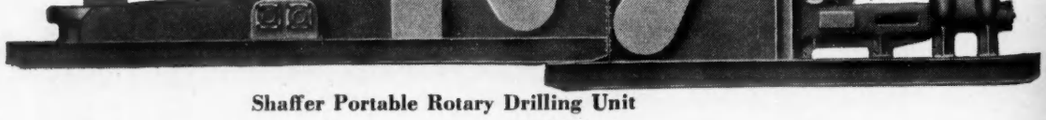
VALVE SEAT GRINDER

Ball Valve Seat Grinder Company

Ball Valve Seat Grinder Company, Syracuse, N. Y., has introduced a new valve seat grinder designed to grind new and regrind used ball and seat valves. Simple and economical to operate, it enables the operator to recondition this equipment at a considerable saving. It is the first portable machine of its kind placed on the market, enabling this reconditioning work to be accomplished in the field.



Ball Valve Seat Grinder



Shaffer Portable Rotary Drilling Unit

This Week with the Industry's EQUIPMENT SUPPLIERS

D. R. Dale on European Metallurgical Trip

D. R. Dale, research director for The S. M. Jones Company, has just concluded one of his frequent field trips to Oklahoma oil fields, and is now bound for Europe where he will study developments in metallurgical circles in England, France and Germany.

Dale's work in engineering and research is well known in the industry, and part of his time is devoted to A.P.I. work. He is now Chairman of the Manufacturers Sub - Committee on Sucker Rods, and a member of the Pumping Equipment and Materials Committees.

Ted Sutter Sails For World Oil Congress

Ted Sutter, general manager, Baker Oil Tools, Inc., Huntington Park, California, sails June 2 on the Normandie for Paris, France, where he will attend the World Petroleum Congress.

Schlumberger Sending Mathieu to France

J. L. Mathieu, Gulf Coast division manager of Schlumberger Well Surveying Corporation, will sail with his family on June 15 for a three-month vacation and business trip to France. While in Paris, he will study the recent technical developments of the various Schlumberger methods.

Byron Jackson Company to Build Plant in Houston

Byron Jackson Company, Los Angeles, has closed a deal for a 6-acre tract on Navigation Boulevard, Houston, where it will erect a $500,000.00 plant for the manufacture of oil tools. The concern took an option on 4 additional adjoining acres. The frontage is in the 6200 block of Navigation. The price paid for the land was not made public.

Byron Jackson Company has branches in Fort Worth, New York, Detroit and Visalia, California. Its main manufacturing plant is at Berkeley, California.

Grove Regulator Company Doubles Plant Capacity

Grove Regulator Company has moved its plant from San Francisco to 1729 Poplar Street, Oakland, California, where the new quarters are double the size and capacity of the old plant. The move was made necessary by increased volume of business, according to M. H. Grove, president of the company.

Texas Steel Company Appoints C. G. Cooper Representative

Cecil G. Cooper has been appointed district representative in charge of the Wichita Falls and Panhandle area for Texas Steel Company. Prior to joining the organization, Cooper represented Decker Tool & Supply Company in East Texas.

D. R. DALE
Studying metallurgical developments in Europe

Parkersburg Celebrates Its Fortieth Anniversary

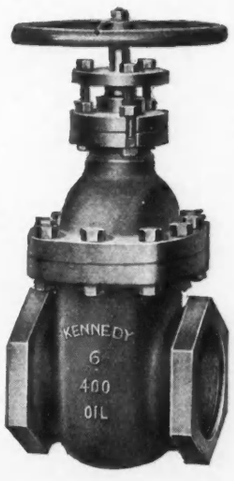
The story of the growth of The Parkersburg Rig & Reel Company from 1897 closely parallels the story of the growth of the oil industry to the fourth largest in the United States. Because the firm recently celebrated its fortieth anniversary, the story of its life is featured in a late issue of "The Rig & Reel," house organ published by the company for years.

The house organ says that the story of Parkersburg is the story of two brothers, John M. and David B. Crawford, both of whom came to this country from County Derry, Ireland, late in the nineteenth century. John started the outfit in 1897 on practically nothing and a little later David came to help him nurse it through infancy. The factory consisted of four departments: a tank shop, a carpenter shop, a machine shop and a blacksmith shop—all housed in a single wood frame structure roofed with sheet metal. If it were standing today it could be put in a small part of Parkersburg's present tank department. The employees totaled 20. Today the pay roll at the factory lists about 750 names.

"Probably the most important of all the departments were the carpenter and tank shops. It was here that the tank builders turned out the open top cypress tanks, hewed walking beams from logs with an adz, built the wood samson and jack posts then in use and made other items of equipment, such

From 300-lb. test to 2500-lb. test

a gate valve for every oil and gas industry service



THE KENNEDY LINE OF VALVES for the oil and gas industry includes types for low, medium, extra heavy and extreme pressures, with screwed or flanged ends, and with stationary or rising stems. Each type is designed with special reference to service requirements in oil and gas fields, refineries, pumping stations, pipe lines and distribution systems. Bodies are heavily proportioned with exceptional strength and rigidity; disc mechanisms have thoroughly proven their easy and positive operation; stuffing boxes, flanges and pipe end hexes are exceptionally deep. Standardizing on Kennedy Valves is a convenience because it gives you a single source for all your valve needs. More than that, it assures dependable operation and lastingly reliable service no matter what may be the fluid, pressure, temperature or frequency of operation.

The Kennedy Valve Mfg. Co., Elmira, N. Y.

KENNEDY

VALVES-PIPE FITTINGS-FIRE HYDRANTS

Some of the Sales and Service Personnel of The Parkersburg

JOHN M. CRAWFORD
Chairman

DAVID B. CRAWFORD
President

P. L. BROOKS
Sales Manager

CASPER A. RUF
Vice President and
General Manager

B. M. FARSON
Secretary and Treasurer

as bull wheels, calf wheels sand reels and band wheels," the story said.

Equipment in the first machine shop consisted of two lathes, three drill presses, one milling machine and one keyseater. Working tolerances in those days were unknown as compared to modern standards. A wrist pin might be as much as one eighth-inch oversize on the pitman end and still be usable in the wood pitmans of that time. The same held true for bull wheel trunions, crown pulleys, and other items than ran in the popular wood bearings.

Parkersburg's original blacksmith shop made stirrups, brake levers, brake bands and other items. Equipment in this department consisted of a three-foot by six-foot furnace, a form table, an anvil and the blacksmith's usual assortment of hammers, tongs, bars, et cetera. It took 13 hours to get pitman stirrup material hot enough to work with. In most cases it was left in the furnace overnight so as to be ready to work on in the morning. Whenever they were ready to bend a stirrup into shape six of the machine shop crew were called in and the hot iron was bent by man power.

The first application of chain drive to oil field equipment was made by Parkersburg in 1899 when it expanded its line to include the chain driven drilling machine and bolted wood derricks.

The first Parkersburg warehouses were established in 1902 at Smithfield and Big Bend, West Virginia. They paid, so warehouses were put up at Casey and Robinson, Illinois, in 1904. Oil was going west, and John then was spending most of his time in the west selling, while David had assumed active management of the eastern business and plant. The westward trend forced Parkersburg to build a branch in Tulsa in 1907. This was the time when the equipment trend was recognized as definitely toward steel. Use of steel derricks in smaller pumping sizes was being considered. Steel companies labored hard doing missionary work to convert the industry to steel walking beams. They generally met cold shoulders, engineers contending even as late as 1913 that steel would never replace wood to any great extent.

In 1912 a warehouse at Drumright, Oklahoma, was added to the Parkersburg list, and in 1913, the 16-year-old factory at Parkersburg, West Virginia, was completely destroyed by a flood. Before rebuilding at the present location the company was reorganized, with John and David Crawford as sole owners.

The new and larger factory was opened in the spring of 1914, in time to get into production before the World War boom period. Cushing field in Oklahoma was depressing the market

The Parkersburg Rig & Reel Company's Plant at Parkersburg, West Virginia

Rig & Reel Company, Celebrating Its Fortieth Anniversary

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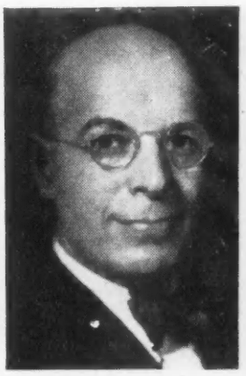
Houston

H. L. DICKSON
District Manager
Tulsa

L. R. McCOLLUM
District Manager
Los Angeles



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Foundry Superintendent

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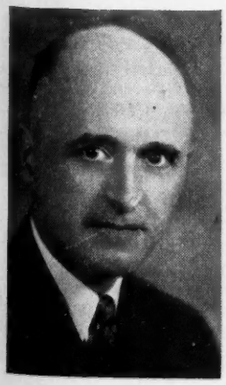

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in that year, but Parkersburg opened a branch in Augusta, Kansas, to be followed in 1915 by another at Eldorado, Kansas. Additional warehouses were established in Ranger, Texas, in 1917 and at Duncan, Oklahoma, in 1918, during which year the oil industry was much concerned over threats by the government to commandeer all oil fields.

The two years, 1920 and 1921, marked the beginning of the engineering era in the oil industry. Geophysical and seismic methods were introduced. Engineering talent was also brought to bear on drilling methods and on every kind and type of equipment. Parkersburg swung with the trend, creating an engineering department, putting William Schwemlein in charge of it. He is there today. It was during these two years that Parkersburg opened a new steel tank shop and acquired a foundry at Pomeroy, Ohio. Branches opened in 1920 by Parkersburg included those at El Dorado, Arkansas; Bowling Green, Kentucky; Shreveport and Monroe, Louisiana; Bristow, Henryetta, Slick and Wilson, Oklahoma. These were followed the next year by branches at Virgil, Kansas; Winnett, Montana; Burbank and Okmulgee, Oklahoma; and Graham, Houston, and Mexia, Texas. It is strange, in connection with the above expansion moves, that 1920 and 1921 were considered depression years for the oil business.

The next three years, 1922, '23 and '24, Parkersburg opened 30 branches in Arkansas, Kansas, Kentucky, Montana, Oklahoma, Wyoming, Texas and Louisiana.

Steel derricks were added to the Parkersburg line in 1925, and the size of the shop for making these had to be doubled in two years. In 1925 the company also built its first Texas pumping jack, incorporating the long stroke principle.

Shortly after Seminole came in in 1926 to be ranked as one of the greatest fields the world has known, Parkersburg put in a branch there. In the same year it added branches at Davenport, Oklahoma; Georgetown, Louisiana; McCamey, Spearman, Trent and Wichita Falls, Texas.

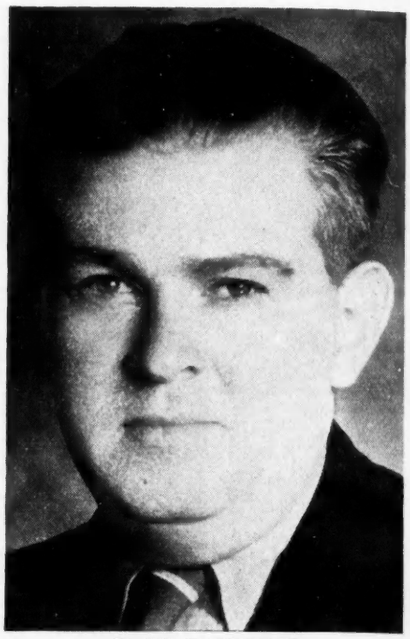
In the years 1927 to 1928, Parkersburg was expanding its foreign and domestic business on a large scale. Shortly after the discovery of East Texas in 1930, the company added eight branches and doubled the size of its general offices. It was during this year the company introduced pipe racks, steel substructures and hydromatic brakes. During the depression years, Parkersburg added four more branches and brought out its long-stroke pumping unit. By 1934, the industry was picking up and the company put in four new branches.

A modern manufacturing plant was built in 1935 to replace the steel equipment department. Los Angeles and Rodessa were added to the string of warehouses. Late in the year, H. J. Lockhart, president, died. His place was taken by David Crawford, brother of the founder.

The year 1936 saw additional improvement and Parkersburg continued to expand.

R. W. Barnhill Joins Mission Organization

Mission Manufacturing Company, Houston, announce appointment of R. W. "Barney" Barnhill as representative in West Texas and New Mexico. Prior to joining the Mission organization Barnhill was associated with Atlas Sup-



R. W. BARNHILL
In West Texas and New Mexico for Mission Manufacturing Company.

ply Company, Hinderliter Tool Company and Pittsburgh Pipe & Supply Company. For the past four years he has been located at Greggton for Pittsburgh Pipe & Supply Co.

C. P. Collins Transferred to Houston

Eastman Oil Well Survey Company announces the transfer of C. P. Collins, former manager of the Northern division at Oklahoma City, to Houston where he becomes manager of the Southern division with offices at 4909 Fannin Street.

Mid-Continent Supply Company Opens New Store

The Mid-Continent Supply Company, Fort Worth, Texas, has opened a new store at Turnertown, Rusk County, Texas, under the supervision of F. R. Files, manager of the companyl's Kilgore store.

American Sand-Banum to Sub-Divide Denver Territory

American Sand-Banum Company, 342 Madison Avenue, New York, advises that it is sub-dividing its Denver territory.

For the present any requirements for the Rocky Mountain division will be taken care of by the Gulf Coast district office, Western Sand-Banum Company, 703 M. & M. Building, Houston. It is planned that M. T. Kappele of the Oklahoma division will cover Oklahoma and Kansas under the supervision of Houston.

Squeaks from the Bull Wheel

Wonder

"Have you ever wondered what you would do if you had Morgan's income?"

"No, but I have often wondered what he would do if he had mine."

Didn't Need Exertion

"You didn't take a vacation last year, did you?"

"No; I thought I needed a rest."

H2O

"What's the formula for water, Jones?" asked the master.

"H I J K L M N O," spelled out the scholar.

"What's that?" barked the master.

The scholar slowly repeated the letters.

"Whatever are you driving at?" said the master. "What gave you that idea?"

"You, sir," said Jones. "You said yesterday it was H to O."

Twice Plastered

"You say this house is double plastered?"

"Sure. Once by the plasterers. Once by the mortgage company."

Should Be Arrested

"Hello, is this the Humane Society?"

"Yes."

"Well, there is a book agent sitting out here in a tree teasing my dog."

Economy Move

"Mr. McPherson in?"

"Gone to lunch, sir. The guv'nor always goes to lunch early. He doesn't have to eat so much as he would later on."

Appreciation

"Why are you clapping for an encore? Her singing wasn't very good."

"I know it," replied the wife, "but I want to have another good look at her frock."

No Quarter

The panhandler approached the walrus-mustached old man in front of the Army and Navy Club.

"Can you spare two bits?" whined the bum.

"Sir, you are talking to General Goodwin," roared the old man. "I give no quarter."

In 1492

As the Santa Maria was tossing about in a storm, a worried seaman approached Christopher Columbus.

"Captain Columbus," he blubbered, "if the world is really flat, like everybody says——"

"Stop fretting," interrupted Columbus impatiently, "I'm telling you the world isn't flat."

"But what makes you so sure?" persisted the seaman.

"If the world was flat," returned Columbus, "where would I have gotten the money to make this trip?"

A Tale Repeated

I've come back to buy the car I was looking at yesterday.

Fine. Now tell me, what was the one dominating thing that made you decide to buy this car?

My wife.

Ever Thus

A gentleman had completed his purchases, and the clerk, in filling out the sales slip, asked:

"What is the name, please?"

"Jepson."

"Chipson?"

"No, Jepson. Sixteen twenty-one West—."

"Your first initial, please."

"Oh, K."

"O. K. Jepson."

Excuse me, it isn't O. K. You didn't understand; I said 'Oh.'

"O. Jepson."

"No. Rub out the O, and let the K stand."

The clerk began to look haggard.

"Will you please give me your initials again?"

"I said K."

"Pardon, you said O. K."

"I said 'Oh'—."

"Just now you said K."

"Allow me to finish. I said 'Oh,' because I didn't understand what you were asking me. I didn't mean it was my initial. My name is Kirby Jepson."

"Oh."

"No. Not O, but K. Here, give me the pencil, and I'll write it myself. There, I guess it's O. K. now."

Correct Version

I can't give you any more credit, sir. Your bill is bigger now than it should be.

I know that. Just make it out as it should be, and I'll pay it.

More

Yes, sir, you had a very bad smash, but I managed to bring you to.

I don't remember. Do you mind bringing me two more?

Viper

"My podner and I are taking a trip through the desert next week. He's taking along a gallon of whiskey for rattlesnake bites."

"And what are you taking?"

"Two rattlesnakes."

Loving Care

"Why use such a high crib for your baby?"

"So we can hear him when he falls out."

Not Up to Date

Does Jenks use modern methods on his farm?

No. He's still using the same kind of a filling station they put up in 1912.

Resource

The bright young pupil looked long and thoughtfully at the second examination question, which read: "State the number of tons of coal shipped out of the United States in any given year." Then his brow cleared and he wrote: "1492—none."

Social Security

"Did you hear about the girl who went to a fancy-dress ball in a suit of armor?"

"No. What happened to her?"

"Nothing."

Oil Company

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